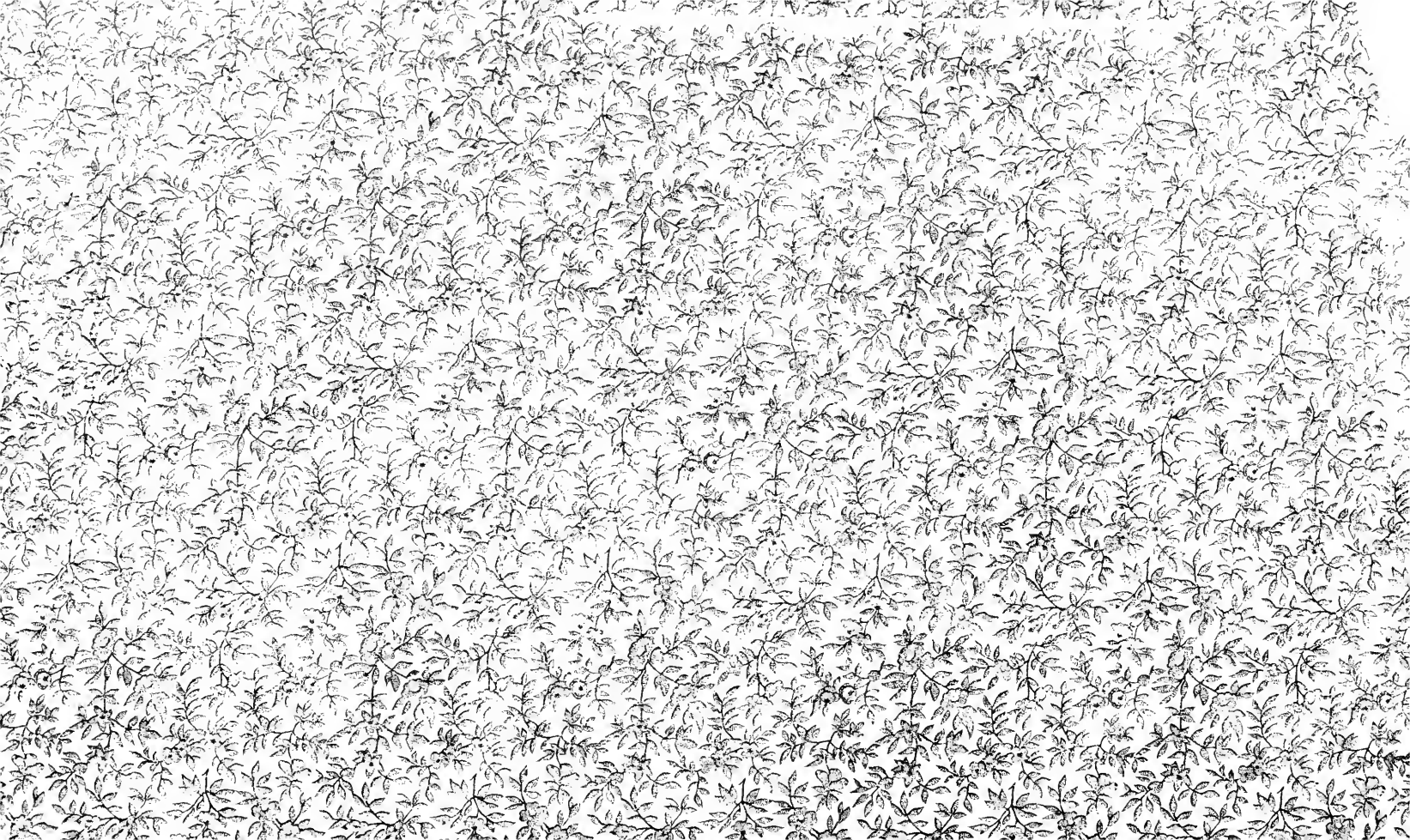
FIFTH BIENNIAL REPORT

OF THE

NORTH CAROLINA BOARD OF HEALTH,

1893-1894.



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FIFTH BIENNIAL REPORT

OF THE

NORTH CAROLINA

BOARD OF HEALTH,

1893-1894.

RALEIGH:
JOSEPHUS DANIELS, STATE PRINTER AND BINDER.
PRESSES OF E. M. UZZELL.
1895.

MEMBERS OF THE BOARD

ELECTED BY THE MEDICAL SOCIETY OF THE STATE OF NORTH CAROLINA.

GEORGE GILLETT THOMAS, M. D., President ..... Wilmington.
Term Expires 1897.

S. WESTRAY BATTLE, M. D. ..... Asheville.
Term Expires 1897.

W. H. HARRELL, M. D. ..... Williamston.
Term Expires 1895

JOHN WHITEHEAD, M. D. ..... Salisbury.
Term Expires 1895.

APPOINTED BY THE GOVERNOR.

W. H. G. LUCAS, M. D. ..... White Hall.
Term Expires 1895.

W. P. BEALL, M. D. ..... Greensboro.
Term Expires 1895.

F. P. VENABLE, PH. D., F. C. S. ..... Chapel Hill.
Term Expires 1895.

JOHN C. CHASE, Sanitary Engineer ..... Wilmington.
Term Expires 1895.

RICHARD H. LEWIS, M. D., Secretary ..... Raleigh.
Term Expires 1895.

STANDING COMMITTEES.

EPIDEMICS—Drs. Lewis and Whitehead.

WATER SUPPLY AND DRAINAGE—Dr. Thomas and Mr. Chase.

HYGIENICS OF PUBLIC SCHOOLS—Drs. Whitehead and Lucas.

CLIMATOLOGY—Dr. S. W. Battle.

ADULTERATION OF FOOD AND MEDICINES—Prof. F. P. Venable.

SANITARY CONDITION OF STATE INSTITUTIONS—Drs. Harrell and Beall.

VITAL STATISTICS—Drs. Lewis, Thomas and Harrell.

LIST OF COUNTY SUPERINTENDENTS OF HEALTH IN THE STATE OF NORTH CAROLINA, DECEMBER 31, 1894.

ALAMANCE—Dr. R. A. Freeman, Burlington.
ALEXANDER—Dr. R. B. Killian, Taylorsville.
ALLEGHANY—Dr. C. G. Fowlkes, Topia.
ANSON—Dr. E. S. Ashe, Wadesboro.
ASHE—Dr. L. C. Gentry, Jefferson.
BEAUFORT—Dr. John C. Rodman, Washington.
BERTIE—Dr. H. V. Dunstan, Windsor.
BLADEN—Dr. Newton Robinson, Elizabethtown.
BRUNSWICK—Dr. D. I. Watson, Southport.
BUNCOMBE—Dr. H. L. Baird, Asheville.
BURKE—Dr. J. L. Laxton, Morganton.
CABARRUS—Dr. Leona M. Archey, Concord.
CALDWELL—Dr. A. A. Kent, Lenoir.
CAMDEN—
CARTERET—Dr. George N. Ennett, Beaufort.
CASWELL—Dr. W. O. Spencer, Yanceyville.
CATAWBA—Dr. J. M. McCorkle, Newton.
CHATHAM—Dr. L. A. Hanks, Pittsboro.
CHEROKEE—Dr. J. F. Abernathy, Murphy.
CHOWAN—Dr. R. A. Winborne, Barnitz.
CLAY—Dr. W. E. Sanderson, Hayesville.
CLEVELAND—Dr. O. P. Gardner, Shelby.
COLUMBUS—Dr. I. Jackson, Whiteville.
CRAVEN—Dr. Leinster Duffy, Newbern.
CUMBERLAND—Dr. J. H. Marsh, Fayetteville.
CURRITUCK—
DARE—Dr. W. H. Peterson, Manteo.
DAVIDSON—Dr. R. L. Payne, Jr., Lexington.
DAVIE—Dr. James McGuire, Mocksville.
DUPLIN—Dr. W. P. Kennedy, Warsaw.
DURHAM—Dr. John M. Manning, Durham.
EDGECOMBE—Dr. Donald Williams, Tarboro.
FORSYTH—Dr. D. N. Dalton, Winston.
FRANKLIN—Dr. E. S. Foster, Louisburg.
GASTON—Dr. J. H. Jenkins, Dallas.
GATES—Dr. I W. Costen, Gatesville.
GRAHAM—
GRANVILLE—Dr. W. O. Baskerville, Oxford.
GREENE—Dr. E. H. Sugg, Snow Hill.
GUILFORD—Dr. A. R. Wilson, Greensboro.

HALIFAX—Dr. I. E. Green, Weldon.
HARNETT—Dr. J. F. McKay, Dickinson.
HAYWOOD—Dr. J. Howell Way, Waynesville.
HENDERSON—Dr. J. L. Egerton, Hendersonville.
HERTFORD—Dr. John W. Tayloe, Union.
HYDE—
IREDELL—Dr. W. J. Hill, Statesville.
JACKSON—Dr. W. F. Tompkins, Webster.
JOHNSTON—Dr. R. J. Noble, Selma.
JONES—Dr. R. A. Whitaker, Trenton.
LENOIR—Dr. C. B. Woodley, Kinston.
LINCOLN—Dr. W. L. Crouse, Lincolnton.
MACON—Dr. S. H. Lyle, Franklin.
MADISON—Dr. James K. Hardwicke, Marshall.
MARTIN—Dr. W. H. Harrell, Williamston.
McDOWELL—Dr. B. A. Cheek, Marion.
MECKLENBURG—Dr. H. M. Wilder, Charlotte.
MITCHELL—Dr C. E. Smith, Bakersville.
MONTGOMERY—Dr. W. A. Simmons, Troy.
MOORE—Dr. Gilbert McLeod, Carthage.
NASH—Dr. J. J. Mann, Nashville.
NEW HANOVER—Dr. R. D. Jewett, Wilmington.
NORTHAMPTON—Dr. H. W. Lewis, Jackson.
ONSLOW—Dr. E. L. Cox, Jacksonville.
ORANGE—Dr. C. D. Jones, Hillsboro.
PAMLICO—
PASQUOTANK—Dr. W. W. Griggs, Elizabeth City.
PENDER—Dr. George F. Lucas, Currie.
PERQUIMANS—Dr. John F. Speight, Hertford.
PERSON—Dr. C. G. Nichols, Roxboro.
PITT—Dr. W. H. Bagwell, Greenville.
POLK—Dr. O. S. Missildine, Tryon.
RANDOLPH—Dr. J. M. Boyette, Ashboro.
RICHMOND—Dr. J. M. Covington, Rockingham.
ROBESON—Dr. T. A. Norment, Jr., Lumberton.
ROCKINGHAM—Dr. D. W. Courts, Reidsville.
ROWAN—Dr. John Whitehead, Salisbury.
RUTHERFORD—Dr. W. A. Thompson, Rutherfordton.
SAMPSON—Dr. John A. Stevens, Clinton.
STANLY—Dr. D. P. Whitley, Millingport.
STOKES—Dr. W. L. McCanless, Danbury.
SURRY—Dr. J. B. Hollingsworth, Mt. Airy.
SWAIN—Dr. R. L. Davis, Bryson City.
TRANSYLVANIA—Dr. C. W. Hunt, Brevard.

TYRRELL—Dr. Ab. Alexander, Columbia.
UNION—Dr. J. E. Ashcraft, Monroe.
VANCE—Dr. W. T. Cheatham, Henderson.
WAKE—Dr. P. E. Hines, Raleigh.
WARREN—Dr. P. J. Macon, Warrenton.
WASHINGTON—
WATAUGA—Dr. W. B. Councill, Boone.
WAYNE—Dr. W. J. Jones, Jr., Goldsboro.
WILKES—Dr. J. W. White, Wilkesboro.
WILSON—Dr. Albert Anderson, Wilson.
YADKIN—Dr. T. R. Harding, Yadkinville.
YANCEY—Dr. J. L. Ray, Burnsville.

LETTER OF TRANSMISSION.

NORTH CAROLINA BOARD OF HEALTH,

OFFICE OF THE SECRETARY,

RALEIGH, N. C., January 4, 1895.

His Excellency, ELIAS CARR,
Governor of North Carolina,

SIR:—In accordance with Section 3, Chapter 214, Laws of 1893, I have the honor to present this the Fifth Biennial Report of the North Carolina Board of Health.

With great respect,

Your obedient servant,

RICHARD H. LEWIS, M. D.,
Secretary and Treasurer.

FIFTH BIENNIAL REPORT

OF THE

NORTH CAROLINA BOARD OF HEALTH.

1893-1894.

In the two years that have elapsed since our last report the cause of public hygiene in our State has been markedly advanced. The interest in this most important subject, both on the part of members of the medical profession and of the people generally, shows a very decided increase. While our work has been, and continues to be, largely "missionary" in character—to carry to those ignorant of, or indifferent to, its saving power the gospel of health—the Board has accomplished much positive good. We feel that we can claim without hesitation that the saving of many valuable lives and the prevention of a large amount of sickness can be directly traced to its efforts. The provisions of the law enacted by the last General Assembly requiring physicians to report immediately to the proper health officer cases of contagious and infectious disease and making it obligatory upon said health officer to see that such diseases "are properly quarantined and isolated within twenty-four hours after the case is brought to his knowledge, and that after the death or recovery or removal of a person sick of either of the diseases mentioned the rooms occupied and the articles used by the patient are thoroughly disinfected in the manner set forth in the printed instructions, both as to quarantine and disinfection, which shall be furnished him by the Secretary of the State Board of

Health," have alone saved a loss to the State in dollars and cents, considering death and sickness in terms of money, far more than has been expended upon the Board from its establishment. Unfortunately the evidence in support of sanitary science is necessarily negative in character. Its function is not to cure disease and thus to positively save from death, but to prevent the inauguration of disease in the first instance and thus to save the well from both sickness and death which in many instances would have surely come to them but for the effective precautions of the health officer. There are many other excellent features in the new law bearing upon the protection of school children from disease, upon the drinking waters of the State, regulating common carriers, and others, for a consideration of which we would refer the reader to the law itself which he will find in another part of this report.

As a result of the marvelous advance in bacteriology a great discovery has been made in "antitoxine," which is regarded as a sure preventive of, and when used soon enough almost a sure cure for, diphtheria, the very name of which strikes terror to a parent's heart. The infectiousness of consumption is no longer disputed and knowing the cause, it can often be prevented by resorting to suitable precautions. With more knowledge we hope to do better work, and in the next two years to save very many more than ever before in the same length of time from sickness and death.

MEETINGS OF THE BOARD.

MINUTES OF THE ANNUAL MEETING AT RALEIGH IN 1893.

RALEIGH, N. C., May 10, 1893.

The North Carolina Board of Health met in regular annual session in the private office of the Yarborough House at 6 P. M.

In the temporary absence of the President Dr. George G. Thomas was, on motion, called to the chair. Present: Drs. Bahnson, Harrell, Hodges, Thomas, Venable, Mr. Chase and the Secretary.

On motion of Dr. Venable the action taken by the Board in the matter of the Quarantine Station at Southport by letter was ratified.

Dr. Bahnson, for the committee appointed to visit the School for the Deaf and Dumb at Morganton, and advise the Board of Directors of the same as to a water supply and system of sewerage, submitted a report of its work, stating that a copy had been sent to Dr. M. L. Reid, Chairman of the Board of Directors. On motion the report was accepted and indorsed.

A motion to proceed to the election of officers was carried, but as some doubt was expressed as to the tenure of office of the Secretary, whether he should hold for the unexpired term to which he was elected under the old law ('85), or whether he should be elected every two years, since the term of office of each member of the Board was made by the new law ('93) only two years, the President was requested to obtain the opinion of the Attorney General and report to the meeting next morning, to which time the Board then adjourned.

RICH'D H. LEWIS,
Secretary.

RALEIGH, N. C., May 11, 1893.

The Board re-assembled in the Senate Chamber of the Capitol at 10 A. M., President Bahnson in the chair.

The President stated that he had consulted the Attorney General as to the term of office of the Secretary and that the latter had given it as his opinion that if the Secretary continued a member of the Board by re-appointment for so long a time he was entitled under the Constitution of the State to hold the office for the remainder of the six-year term of the late Secretary, Dr. Thomas F. Wood, to which he was elected.

Dr. Henry T. Bahnson was nominated for President and unanimously re-elected.

Messrs. Chase and Venable were appointed a committee to audit the accounts of the Treasurer. They reported them to be correct.

Adjourned.

RICH'D H. LEWIS,
Secretary.

ACTION OF THE NORTH CAROLINA BOARD OF HEALTH IN REGARD TO THE RESIGNATION OF DR. J. A. HODGES AND THE ELECTION OF HIS SUCCESSOR.

The following letter, which explains itself, was sent to every member of the Board:

NORTH CAROLINA BOARD OF HEALTH,
SECRETARY'S OFFICE,
RALEIGH, November 6, 1893.

MY DEAR DOCTOR:—I am instructed by President Bahnson to notify the members of the Board of the resignation, upon his removal from the State, of Dr. J. A. Hodges, and to ask each member to indicate in a letter to the Secretary (in order to save the expense of a meeting for the purpose) what action he desires taken thereon, and his choice for his successor.

Please write me promptly in accordance with the above and oblige,

Yours truly,

RICH'D H. LEWIS,
Secretary.

By the answers to the above letter received from all the members of the Board, and now on file in the Secretary's office, the resignation of Dr. Hodges was accepted and Dr. John Whitehead, of Salisbury, was unanimously elected to fill the vacancy.

Dr. Whitehead was duly notified of his election and signified his acceptance of the position.

RICH'D H. LEWIS,
Secretary.

MINUTES OF THE ANNUAL MEETING AT GREENSBORO IN 1894.

GREENSBORO, N. C., May 15, 1894.

The North Carolina Board of Health met in regular annual session in Room 15, Benbow House, at 9 P. M. There were present Drs. Bahnson, President; Harrell, Whitehead and Venable, Mr. Chase and the Secretary.

The minutes of the last meeting and of the action of the Board in regard to the resignation of Dr. J. A. Hodges and the election of his successor were read and approved.

Messrs. Chase and Venable were appointed by the President a committee to audit the accounts of the Treasurer.

The matter of the erection of a first-class Quarantine Station at Southport was informally discussed. Great regret was expressed at the action of the authorities of the city of Wilmington in refusing to appropriate the $5,000 necessary as a preliminary condition to receiving $20,000 from the State.

The transmission of typhoid fever was the subject of a general discussion of a very interesting character.

On motion it was ordered that the Board meet hereafter three times a year—every four months—the annual meeting to be held as usual with the State Medical Society, and the other two in September and January at such place as the Board may select and on such day as the President may appoint.

On motion Salisbury was selected as the place for the next or September meeting. The President was requested to appoint the day at his convenience.

On motion it was ordered that the public institutions of the State, including the convict camps, be inspected as far as practicable during the current year.

On motion the Secretary was instructed to purchase a library of reference books on sanitary subjects for the use of his office, and also similar books for the use of members of the Board.

Adjourned to 12 o'clock to-morrow.

RICH'D H. LEWIS,
Secretary.

GREENSBORO, N. C., May 16, 1894.

The Board re-assembled in Room 15 of the Benbow House at 6:40 P. M.: President Bahnson in the chair. Present: Drs. Bahnson, Battle, Harrell and Whitehead, Mr. Chase, Passed Assistant Surgeon J. J. Kinyoun, M. H. S., and the Secretary.

In response to an invitation from the Board to address them, Dr. Kinyoun made the following statement:

The Surgeon General of the Marine Hospital Service, Dr. Wyman, is very anxious to have all the larger ports put in good shape. All the ports except Wilmington are already well provided with quarantine facilities. It is his earnest desire to have a perfectly equipped station at Wilmington. The rules under the law of February, 1893, require that the dunnage of any infected vessel must be disinfected by steam and the hold of said vessel by 10 per cent. sulphur. If such facilities do not exist at a port the vessel must be remanded to a port that is supplied. This would wreck the commerce of Wilmington as matters now stand, which the Government would be very loth to do. An order has been issued to captains from West Indies and South American ports having yellow fever to report at once to United States stations. All sailing vessels from an infected port in West Indies are advised to go by one of the national stations at Tortugas or Sapelo for inspection and disinfection. The Surgeon General wishes to know if a

properly equipped station cannot be established by the State. If not the United States have the law and ample means to do so.

After a full discussion of the above statement from the Marine Hospital Service the following motion was introduced by Dr. Battle and unanimously adopted:

Moved, that in view of the inability or the unwillingness of the city of Wilmington to contribute its part towards carrying out the act of the last General Assembly providing for the erection of a first-class Quarantine Station at Southport, the Secretary of this Board be instructed to officially request the United States Marine Hospital Service to take charge of and operate that station; and that the Secretary be authorized to explain this action on the part of the Board.

The Auditing Committee reported that they had examined the accounts of the Treasurer and found them correct. Report adopted.

On motion the Board adjourned to meet in Salisbury in September.

RICH'D H. LEWIS,
Secretary.

MINUTES OF THE MEETING AT SALISBURY, SEPTEMBER 13, 1894.

SALISBURY, N. C., September 23, 1894.

The Board met after the adjournment of the Health Conference in private session at the Central Hotel. Present: Drs. Bahnson, Battle, Thomas, Whitehead and Lewis.

Drs. Bahnson and Lewis were elected delegates to the American Public Health Association. The appointment of delegates to the National Conference of State Boards of Health was left to the President. A letter from Dr. C. O. Probst, Secretary of the National Conference of State Boards of Health, stating that the annual dues of North Carolina for 1892, $10, had not been paid, was read. Upon a state-

ment from the Treasurer of the Board that such was the fact, due doubtless to the prolonged illness of the Treasurer at that time, a motion was passed ordering it paid.

On motion the Secretary was ordered to have printed in pamphlet form, and generally distributed, the article on "The Prevention of Tuberculosis," by Dr. S. Westray Battle, and that on "Drinking Water in its Relation to Malarial Diseases," by the Secretary, just read before the Health Conference.

On motion Mr. J. C. Chase, the Engineer of the Board, was requested to make a thorough inspection of the various State institutions and of the water supplies and sewerage systems, present and prospective, of the more important cities and towns of the State and to report the results of the same to the Board.

On motion the meeting adjourned.

RICHD H. LEWIS,
Secretary.

PROCEEDINGS HAD IN REGARD TO THE ELECTION OF A PRESIDENT OF THE BOARD TO SUCCEED DR. H. T. BAHNSON, RESIGNED.

Having been notified by his Excellency the Governor of the resignation from the Board of Dr. H. T. Bahnson, of Salem, for many years its active and efficient President, I addressed the following letters to each member of the Board. They show the method of the election of Dr. George Gillett Thomas, of Wilmington, as his successor in the presidency:

RALEIGH, N. C., November 21, 1894.

MY DEAR DOCTOR:—Dr. Bahnson, being a member of two boards, has thought it proper to resign from one of them, and has, I am sorry to say, elected to give up ours. We are, therefore, without a President, and the machinery of our law requires one. In order to save expense and time it has occurred to me that it would be best for me to call for

nominations by letter and then to send a list of the nominees to each member of the Board for his ballot. If you approve this plan please make a nomination. If not, let me have your views as to the best course of action, and oblige,

Yours very truly,

RICH'D H. LEWIS,

Secretary.

P. S.—If a majority of the Board should nominate the same person we will, if you approve, consider that an election. R. H. L.

RALEIGH, N. C., December 8, 1894.

MY DEAR DOCTOR:—The "returns" are all in, and Dr. G. G. Thomas has been nominated by six (6) members and Dr. S. W. Battle by two (2) members for President of the Board. According to the understanding had in my former letter—that if any one member should happen to be nominated by a majority of the Board we would, without further correspondence, consider him elected—I now announce the election of Dr George Gillett Thomas as President.

Very truly yours,

RICH'D H. LEWIS,

Secretary.

His Excellency the Governor appointed Dr. W. P. Beall, of Greensboro, to fill the vacancy on the Board caused by the resignation of Dr. Bahnson.

PROCEEDINGS

OF THE

CONJOINT SESSIONS OF THE STATE BOARD OF HEALTH

WITH THE

STATE MEDICAL SOCIETY IN 1893 AND 1894.

THE CONJOINT SESSION AT RALEIGH, MAY 11, 1893.

Dr. H. T. Bahnson was called upon to preside. He announced the first business in order to be the reading of the annual report of the Secretary:

ANNUAL REPORT OF THE SECRETARY OF THE NORTH CAROLINA BOARD OF HEALTH.

BY RICHARD H. LEWIS, M. D., RALEIGH, N. C.

By section 27 of the Act Relating to the Board of Health the Secretary is required to submit his annual report at this, the annual meeting of the Board. He is also required by section 3 of the same to make biennially to the General Assembly, through the Governor, a report of the work of the Board. In compliance with the latter the fourth biennial report for 1891-'92 was prepared and submitted, and the portion of it covering the period from the last annual meeting to January 1, 1893, is respectfully referred to as a part of this report. [Read from the biennial report the references to the life and work of Dr. Thomas F. Wood.]

On January 2d an invitation to meet with the State Board of Health in a Health Conference on January 24th

in the city of Raleigh was mailed to the number of six hundred and fifty to the officers of the State Government, members of the General Assembly, Mayors of towns, County Superintendents of Health, Chairmen of Boards of County Commissioners, physicians and other prominent men. The attendance was not very large, but varied and of good quality. The number of County Superintendents of Health present (three, and one of them a member of the Legislature) was discouraging, particularly in view of the fact that one of the principal subjects for discussion named in the invitation was their own salaries, about which much complaint had been made. The following are the proceedings of the Health Conference:

RALEIGH, N. C., January 24, 1893.

On a call from the President of the State Board of Health, Dr. H. T. Bahnson, of Salem, that body met in the city of Raleigh on the above date, there being present Drs. J. H. Tucker, J. A. Hodges, Geo. G. Thomas, Prof. F. P. Venable and the Secretary.

There were present also Superintendents of Health, practicing physicians and other citizens interested in sanitation and the health of the State, all of whom were invited to meet with the State Board of Health in a Health Conference.

In the absence of President Bahnson the Secretary called the Conference to order, stating the object of the Conference to be a consideration of the best method to prevent the introduction of pestilential diseases into the State, the method of fixing the salaries of Superintendents of Health and other matters relating to the general health of the State.

He introduced the Mayor of the city of Raleigh, who extended a cordial welcome to the Conference and assured

it of his hearty support in its efforts to promote the welfare of the State in the all-important matter of health.

The first order of business being the selection of a permanent chairman, Dr. Thomas nominated Col. W. H. S. Burgwyn, a man who had shown himself to be actively interested in the health matters of North Carolina. Col. Burgwyn was unanimously elected and on assuming the chair expressed himself as feeling highly honored by being invited to preside over the meeting and gladly offered all the assistance in his power to the Conference in improving the safeguards against the ravages of plagues and epidemics. The prosperity of the country is largely dependent upon the medical profession, and this is especially noteworthy of the next twelve months when the country is to undertake the stupendous task of entertaining the whole world and, at the same time, guard her citizens from the terrible plague which caused such destruction of life in Europe last year and which is apparently only waiting for the approach of warm weather to renew its work of devastation and destruction.

The Secretary presented as the first duty of the Conference the amendment of the health laws of the State, and read a copy of a law suggested by the President, after which he stated that a substitute for the old law had been drawn up by himself for the consideration of the Conference.

It was moved and decided that the Secretary read his proposed substitute for the existing laws section by section and if there be no objection raised the section be considered as approved by the Conference.

Section 1. Adopted without objection.

Sec. 2. There being some doubt as to whether the proposed reading would call for the election of six new members of the Board this year, it was corrected to make the

fact clear that the successors of the present incumbents were to be elected only at the expiration of the terms of the present members; each new member being elected for six years.

SEC. 3. The important part of this section is the duty of the Board to inspect the public institutions of the State, and the Secretary explained that before any action was taken he had communicated with the chief officers of the asylums and of the Penitentiary and they had expressed the opinion that such inspection would be very proper and desirable. The section was approved; but later Dr. J. W. Jones thought that the inspection of the stockades should be made oftener than once a year, as frequently a stockade was not in existence so long as a year, and in that event it might not be inspected at all. An amendment was added to the section, providing for inspection as much oftener as requested by the "Board of Charities." The Secretary said that he had considered the advisability of having the superintendents of the public institutions make monthly reports to the Board of Health, but as they have to keep a record of these things any way, and include them in their regular reports, he thought it not well to impose this duty upon them.

SEC. 4. Approved without discussion.

SEC. 5. This section was amended so as to make eligible to membership in the County Boards of Health all properly registered physicians.

SEC. 6. Dr. Hodges thought the law regarding fines against Superintendents had been a dead law; that he believed these fines had never been collected. He had at times been delinquent in sending in his reports when he was a Superintendent and had never paid a fine. The Secretary explained that heretofore it had not been obligatory on the Secretary to notify the County Commissioners of the

delinquency of the Superintendents. On motion the section was amended, making it the duty of the Secretary of the State Board to notify the Commissioners on the 11th of each month of any delinquency on the part of Superintendents to send in their reports by the 10th. As amended the section was adopted.

SEC. 7. This section, relating to the salaries of Superintendents of Health, provoked a very great deal of discussion by the members of the Conference generally. The Secretary thought the salaries of these officers should be imposed and regulated by legislative enactment so that they could act independently in performing their duties. There was a unanimity of opinion as to the fact that the salaries of the Superintendents were far from satisfactory, but there seeming to be an inability to come to any conclusion as to the best and wisest plan for improving them, Dr. Hodges moved that the matter be referred to a committee who should consider it and report at the afternoon session. The motion was carried.

SEC. 8. The Secretary explained that this section was introduced in its proposed form for the purpose of making one definite day for the election of Superintendents in all the counties of the State, and so that all terms of office would expire at the same time. Dr. Thomas thought the reason why local Boards of Health held such infrequent meetings was because they were invested with no power except to give advice and their advice generally resulted in nothing. The section was adopted.

SEC. 9. Adopted.

SEC. 10. Adopted.

SEC. 11. Adopted.

SEC. 12. Adopted.

SEC. 13. Dr. Hodges thought we ought to deal with great tenderness with the affairs of the public schools.

Some committeemen lived ten miles apart, and it would be hard to get them together to consider these things. The Secretary explained that it was only the diseases that were really dangerous to life that were included in this section. The section is intended to apply especially to city schools, but should also apply to county schools. Dr. Crouse thought the last clause requiring the child who persisted in coming to school while it was in dangerous contact with contagious diseases at home, to be dismissed from the school for the remainder of the term, a hardship on the child and not a punishment on the parent, where the blame should rest. After some discussion it was decided to leave this clause out, and as so amended the section was passed.

SEC. 14. Adopted.

SEC. 15. Amended so as to provide for the early removal of a suspect from the State, and was then adopted.

SEC. 16. Adopted after a slight amendment.

SEC. 17. This section was explained to refer to potable waters. It was then adopted.

SEC. 18. Adopted after a slight amendment.

The remaining sections were adopted without much discussion.

The Chair attempted to appoint the committee to take into consideration the matter of salaries of Superintendents of Health, but there were none willing to assume the office, and on motion it was referred back to the whole meeting for action and then postponed to the afternoon session.

The Conference then adjourned to 3 P. M.

AFTERNOON SESSION.

The Conference was called to order by the Chairman at 3 o'clock.

Section 7, relating to salaries of Superintendents, was introduced as the first order of business and again evoked much discussion, with final result of adopting the section as it now stands.

The matter of taking some action looking to securing some law of compulsory vaccination elicited quite a spirited debate. All present seemed to agree as to the desirability of a more general practice of vaccination, but some were doubtful as to the advisability of attempting to secure legislation to require vaccination just at present, as it might jeopardize the whole bill.

On motion the whole bill was adopted as a substitute for the present Act Relating to the Board of Health.

By invitation Dr. W. G. Curtis, Quarantine Physician of the station at the mouth of the Cape Fear river, read a paper with a description of the station as it now is, a recital of the needs of the station and a discussion of the probability of cholera getting into this State the coming summer.

During the latter part of the meeting Dr. Geo. G. Thomas presided, as Col. Burgwyn was obliged to leave.

After the reading of Dr. Curtis's paper, which was listened to with much interest, the Conference adjourned *sine die*.

RICH'D H. LEWIS,
Secretary.

Upon request the President of the Senate and the Speaker of the House announced a joint meeting of their respective Committees on Public Health—the first committees, by the way, on public health ever appointed by any Legislature in the history of the State, I am told—for

the night after the adjournment of the Conference, to consult with members of the Board of Health in regard to sanitary matters generally, and the proposed legislation in the interest of the public health in particular. Messrs. Hodges, Venable, Thomas and the Secretary appeared before them, and the bill was read over and explained. Senator Lucas, of Bladen county, Chairman of the Senate Committee on Public Health, who had just been appointed on the Board by Governor Carr, took charge of the bill and introduced it in the Senate. The Secretary again appeared before the Senate Committee, to which it was referred on its introduction, and it was favorably reported with unanimity. He also had a number of personal interviews with Senators in regard to the importance of the act and besides sent a letter with a copy of the act to about one hundred physicians, County Superintendents and others, urging them to use their influence with their Senators and Representatives in effecting the passage of the bill.

This letter bore fruit, and after some delay and much vexation of spirit on the part of your Secretary the bill passed the Senate by a vote of thirty-four to eight, though somewhat damaged by amendments. The House Committee unanimously recommended its passage. Notwithstanding that fact when it came up on its second reading it was laid on the table in short order by a considerable majority, which of course would have been the end of it but for the tact and parliamentary skill of the Hon. Edmund Jones, of Caldwell, a warm personal friend of your Secretary, who got it up again and with the active assistance of a number of the best men in the House, medical and lay, secured its passage. I was very anxious to have some of the Senate amendments corrected in the House, but our friends in that body advised strongly against attempting any amendment on the ground that if they ever began to

amend it it would probably come out in worse shape than the Senate had left it. Your Secretary deferred to their wisdom, feeling that it was better to take what we had than to run a serious risk of losing much more.

The act as finally passed differs from that proposed by the Health Conference essentially in these particulars: The appointment of five members instead of three out of the nine is given to the Governor and the term of office of all is made the same, two years—an unfortunate change, I think, in both respects.

The annual appropriation of $3,000 asked for was cut down to $2,000, the same as heretofore. In other respects it is essentially as introduced.

On the whole we have made a decided advance, as a comparison of the new with the old law will clearly show, I think. The old law, which was incorporated in the new, was improved in many respects and many new and valuable sections, providing for much better protection against the introduction and spread of contagious and infectious diseases, and for the preservation of water supplies, as well as improvements in other respects, were added. While our annual appropriation was not increased in dollars it was materially augmented by the removal of the $250 limit to our requisition on the State Printer for stationery and printing. The emergency fund was also increased from $2,000 to $5,000. The following is the law as it now stands:

AN ACT IN RELATION TO THE BOARD OF HEALTH, RATIFIED MARCH 1, 1893.

The General Assembly of North Carolina do enact:

SECTION 1. That the Medical Society of the State of North Carolina shall choose from its members by ballot four members, and the Governor of the State shall appoint five other persons (one of whom shall be a sanitary engineer) and they shall constitute "The North Carolina Board of Health."

SEC. 2. The members of the Board of Health elected by the State Medical Society shall be chosen to serve two years. Their term of office shall begin immediately upon the expiration of the meeting at which they were elected. Those appointed by the Governor shall serve two years, their term of office beginning with the first regular meeting of the Board after their appointment. In case of death or resignation the Board shall elect new members to fill the unexpired terms: *Provided*, the Governor shall fill such vacancies as may occur where he has made appointments.

SEC. 3. That the North Carolina Board of Health shall take cognizance of the health interests of the people of the State, shall make sanitary investigations and inquiries in respect to the people, employing experts when necessary; shall investigate the causes of disease dangerous to the public health, especially epidemics, the sources of mortality, the effect of locations, employments and conditions upon the public health. They shall gather such information upon all these matters for distribution among the people, with the especial purpose of informing them about preventable diseases. They shall be the medical advisers of the State and are herein specially provided for, and shall advise the government in regard to the location, sanitary construction and management of all State institutions, and shall direct the attention of the State to such sanitary matters as in their judgment affect the industries, prosperity, health and lives of the people of the State. They may make an inspection once in each year, and at such other times as they may be requested to do so by the State Board of Charities, of all public State institutions, including all convict camps under the control of the State Penitentiary, and make a report as to their sanitary condition, with suggestions and recommendations to their respective boards of directors or trustees; and it shall be the duty of the officials in immediate charge of said institutions to furnish all facilities necessary for a thorough inspection. The Secretary of the Board shall make biennially to the General Assembly, through the Governor, a report of their work.

SEC. 4. The State Board shall have a President and a Secretary, who shall also be Treasurer, to be elected from the members composing the Board. The President shall serve two years and the Secretary-Treasurer two years. The Secretary-Treasurer shall receive such yearly compensation for his services as shall be fixed upon by the Board, not to exceed one thousand dollars, but the other members of the Board shall receive no pay, except that each member shall receive four dollars a day and necessary traveling and hotel expenses when on actual duty attending the meetings of the Board or pursuing special investigations in the State, but when attending important sanitary meetings in other sections, the number of delegates thereto being limited to two, only actual traveling and hotel expenses shall be allowed. These sums shall be paid by the Treasurer on authenticated requisition approved and signed by the President.

SEC. 5. There shall be an auxiliary Board of Health in each county in the State. These Boards shall be composed of all registered physicians resident in the county, the Mayor of the county town, the Chairman of the Board of County Commissioners and the City Surveyor, when there is such an officer; otherwise the County Surveyor. From this number one physician shall be chosen by ballot to serve two years, with the title of Superintendent of Health. His duty shall be to gather vital statistics upon a plan designated by the State Board of Health. He shall always promptly advise the Secretary of the State Board of the unusual prevalence of disease in his county, especially of typhoid fever, scarlet fever, diphtheria, yellow fever, small-pox, or cholera. His reports shall be made regularly, as advised by the State Board, through their Secretary; and he shall receive and carry out as far as possible such work as may be directed by the State Board of Health. He shall make the medico-legal *post-mortem* examinations for coroners' inquests, and attend the prisoners in jail, home for the aged and infirm, and house of correction, and make an examination of lunatics for commitment. He shall be the sanitary inspector of the jail and home of his county, making monthly reports to the Board of County Commissioners: *Provided*, that if for any cause the County Board of Health should fail to meet as hereinafter set forth and elect a Superintendent, the County Commissioners shall elect from those physicians resident in the county eligible to membership in the County Board a Superintendent of Health: *Provided further*, that it shall be unlawful for said County Commissioners to elect any one not eligible to membership in the County Board to the office of County Superintendent of Health, if any such qualified physician can be found in the county willing to accept the office.

SEC. 6. Monthly returns of vital statistics, upon a plan to be made by the State Board of Health, or their Secretary acting under their instructions, shall be made by the County Superintendent to the Secretary of the State Board, and a failure to report by the tenth of the month for the preceding month shall subject the delinquent to a fine of one dollar for each day of delinquency, and this amount shall be deducted from the salary of the Superintendent by the Board of County Commissioners on the statement of such delinquency by the Secretary of the State Board of Health; and the said Secretary is hereby required to notify, on the eleventh day of each month, the Chairman of the Board of County Commissioners of such delinquency. The County Superintendent shall report to the Secretary of the State Board the presence in his county of any case of small-pox, yellow fever, typhus fever or cholera within twenty-four hours after it has come to his knowledge, and upon failure to make such report within the prescribed time the County Commissioners shall deduct five dollars from his salary for each day of delay in reporting.

SEC. 7. The salary of the County Superintendent of Health shall be

paid out of the county treasury upon requisition and the proper vouchers as follows: The salary of the Superintendent of Health, or any other member of the Board who is required to do the service assigned him, shall be in accordance with the medical fees usual in his county, and for each inspection of the jail and county home, which he shall make monthly, he shall be paid as for one medical visit: *Provided*, that a definite salary of not less than ten nor more than one thousand dollars may be paid in lieu of fees if mutually agreeable to the Board of County Commissioners and the County Superintendent.

SEC. 8. The biennial meeting for the election of officers shall be, for the State Board of Health, on the second day of the annual meeting of the Medical Society of the State of North Carolina in eighteen hundred and ninety-three and every two years thereafter; for the County Boards it shall be held in the county court-house between the hours of 12 M. and 1 P. M. on the first Monday in September, eighteen hundred and ninety-three, and each two years thereafter: *Provided*, that the two-year term of office of any Superintendent shall not be curtailed thereby; but his successor, who shall be elected at the meeting on the first Monday in September, eighteen hundred and ninety-three, shall qualify upon the expiration of said term and hold office until the first Monday in September, eighteen hundred and ninety-five, when all County Superintendents shall be elected for the full term of two years, beginning and ending with the first Monday in September. In order to secure uniformity and certainty of action it shall be the duty of the Secretary of the State Board of Health to mail to every person in the State eligible to membership in the County Boards of Health, whose address can be obtained, on or before the twentieth day of the August next preceding the time of meeting hereinbefore appointed, a printed notice of said meeting setting forth time and place.

SEC. 9. Inland quarantine shall be under the control of the County Superintendent of Health, who shall see that diseases especially dangerous to the public health, viz., small-pox, diphtheria, scarlet fever, yellow fever, typhus fever and cholera, are properly quarantined and isolated within twenty-four hours after the case is brought to his knowledge; and that after the death or recovery or removal of a person sick of either of the diseases mentioned the rooms occupied and the articles used by the patient are thoroughly disinfected in the manner set forth in the printed instructions, both as to quarantine and disinfection, which shall be furnished him by the Secretary of the State Board of Health. The expense of the quarantine and of the disinfection shall be borne by the householder in whose family the case occurs, if able; otherwise by the city, town or county of which he is a resident. The failure on the part of a County Superintendent of Health to perform the duties imposed in this section shall be punished by the deduction of five dollars for each

day of delinquency from his salary by the Board of County Commissioners; and if it shall appear to the satisfaction of the County Board of Health that the death of any person from the spread of the disease can justly be attributed to such failure of duty on his part, he shall be deposed from office and a successor immediately elected to fill out his unexpired term. Any person neglecting or refusing to comply with or in any way violating the rules promulgated in the manner above set forth on the subjects of quarantine and disinfection shall be deemed guilty of a misdemeanor, and upon conviction shall be fined or imprisoned, at the discretion of the court, not less than five nor more than fifty dollars, or less than ten nor more than thirty days. In case the offender be stricken with the disease for which he is quarantinable, he shall be subject to the penalty on recovery, unless in the opinion of the Superintendent it should be omitted: *Provided, however*, that in any city or incorporated town having a regularly appointed medical health officer who is a member of the County Board of Health, the duties assigned in this section to the County Superintendent of Health shall be performed by the said medical health officer for the people of his city or town, and he shall be subject to the same penalties for dereliction of duty at the hands of the Board of Aldermen or Town Commissioners as are directed to be imposed by the County Commissioners and County Board of Health upon the Superintendent: *Provided further*, that the quarantine of ports shall not be interfered with, but the officers of the local and State Boards shall render all aid in their power to quarantine officers in the discharge of their duties upon the request of the latter: *Provided*, that the custody and care of any child or other person may remain in custody of parent or family.

SEC. 10. When a householder knows that a person within his family is sick with either of the diseases enumerated in section nine he shall immediately give notice thereof to the health officer or Mayor, if he resides in a city or incorporated town, otherwise to the County Superintendent of Health, and upon the death or recovery or removal of such person the rooms occupied and the articles used by him shall be disinfected by such householder in the manner indicated in Section Nine. Any person neglecting or refusing to comply with any of the above provisions shall be deemed guilty of a misdemeanor, and upon conviction shall be fined not less than one dollar nor more than fifty dollars.

SEC. 11. When a physician knows that a person whom he is called to visit is infected with small-pox, diphtheria, scarlet fever, typhus fever, yellow fever or cholera he shall immediately give notice thereof to the health officer or Mayor, if the sick person be in a city or incorporated town, otherwise to the County Superintendent of Health, and if he refuses or neglects to give such notice of it in twenty-four hours he shall be guilty of a misdemeanor and shall be fined for each offense not less

than ten nor more than twenty-five dollars. And it shall be the duty of the said County Superintendent, health officer or Mayor receiving such notice of the presence of a case of small-pox, yellow fever, typhus fever or cholera within his jurisdiction to communicate the same immediately by mail or telegraph to the Secretary of the State Board of Health. A failure to perform this duty for twenty-four hours after the receipt of the notice shall be deemed a misdemeanor, and shall subject the delinquent upon conviction to a fine of not less than ten nor more than twenty-five dollars.

SEC. 12. The County Superintendents of Health, or the Boards of Health in the several cities and towns where organized, otherwise the authorities of said cities or towns, shall cause a record to be kept of all reports received in pursuance of the preceding sections, and such records shall contain the names of all persons who are sick, the localities in which they live, the diseases with which they are affected, together with the date and names of all persons reporting any such cases. The Boards of Health of cities and towns wherever organized, and where not the Mayors of the same, and in other cases the County Superintendent of Health, shall give the school committee of the city or town, the principals of private schools and the Superintendent of Public Instruction of the county, when the schools are in session, notice of all such cases of contagious diseases reported to them according to the provisions of this act. A failure to perform this duty for twenty-four hours after the receipt of the notice shall be deemed a misdemeanor, and subject the delinquent upon conviction to a fine of not less than ten nor more than fifty dollars.

SEC. 13. The school committees of public schools, superintendents of graded schools and the principals of private schools shall not allow any pupil to attend the school under their control while any member of the household to which said pupil belongs is sick of either small-pox, diphtheria, measles, scarlet fever, yellow fever, typhus fever or cholera, or during a period of two weeks after the death, recovery or removal of such sick person; and any pupil coming from such household shall be required to present to the teacher of the school the pupil desires to attend a certificate from the attending physician, city health officer or County Superintendent of Health of the facts necessary to entitle him to admission in accordance with the above regulations. A wilful failure on the part of any school committee to perform the duty required in this section shall be deemed a misdemeanor, and upon conviction shall subject each and every member of the same to a fine of not less than one nor more than twenty-five dollars: *Provided*, that the instructions in accordance with the provisions of this section given to the teachers of the schools within twenty-four hours after the receipt of each and every notice shall be deemed performance of duty on the part of

the school committee. Any teacher of a public school and any principal of a private school failing to carry out the requirements of this section shall be deemed guilty of a misdemeanor, and upon conviction shall be fined not less than one nor more than twenty-five dollars.

SEC. 14. When a person coming to a city or town from abroad or from some other place in this State is infected or has lately been infected with either of the diseases mentioned in Section Nine the local Board of Health where such exists, otherwise the Board of Aldermen or Board of Town Commissioners, shall make effective provision in the manner which it judges best for the safety of the inhabitants by removing such person to a separate house or otherwise, and by providing nurses and other assistance and necessaries, which shall be at the charge of the person himself or his parents, where able, otherwise at the charge of the city, town or county to which he belongs.

SEC. 15. The Board of Health, or, in case there is no Board of Health, the Board of Aldermen or Town Commissioners of a city or town near to or bordering upon either of the neighboring States, may appoint, by writing, suitable persons to attend at places by which travelers may pass from infected places in other States, who may examine such travelers as may be suspected of bringing any infection dangerous to the public health, and if it need be may restrain them from traveling until licensed thereto by the Board of Health or Board of Aldermen or Town Commissioners of the city or town to which they may come. A traveler coming from such infected places who, without such license, travels within this State (except to return by the most direct route to the State whence he came) after he has been cautioned to depart by the persons so appointed, shall be isolated or ejected, at the discretion of the local city or town or county Board of Health; and upon refusal to comply with the regulations of the said Boards of Health or either of them on this subject shall be guilty of a misdemeanor, and upon conviction shall be fined not less than twenty-five nor more than fifty dollars or imprisoned not more than thirty days. And all common carriers bringing into this State any such persons as named above are hereby required to return them to some point without this State, if required by a city, town or county Board of Health. Nothing in this section shall prevent the State Board of Health in time of epidemics from appointing such additional examiners as they may deem necessary to the preservation of the public health.

SEC. 16. No railroad corporation or other common carrier or person shall convey or cause to be conveyed through or from any city, town or county in this State the remains of any person who has died of smallpox, measles, scarlet fever, diphtheria, typhus fever, yellow fever or cholera until such body has been disinfected and encased in such manner as shall be directed by the State Board of Health, so as to preclude any

danger of communicating the disease to others by its transportation; and no local registrar, clerk or health officer, or any other person, shall give a permit for the removal of such body until he has received from the Board of Health of the city, or from the Board of Aldermen or Town Commissioners, or the County Superintendent of the city, town or county where the death occurred, a certificate stating the cause of death and that the said body had been prepared in the manner set forth in this section; which certificate shall be delivered in duplicate to the agent or person who receives the body, and one copy shall be pasted on the box containing the corpse; said certificate shall be furnished in blank by the transportation company when no local board of health exists. During an epidemic of cholera all common carriers shall so arrange their water-closets as to catch in water-tight receptacles the dejections of all persons using the same and shall disinfect the said dejections in a manner satisfactory to the State Board of Health before emptying them. Any person violating the provisions of this section shall be punished by fine not exceeding twenty-five dollars.

SEC. 17. In times of epidemics of small-pox, yellow fever, typhoid fever, scarlet fever, diphtheria, typhus fever, cholera, the State Board of Health shall have sanitary jurisdiction in all cities and towns not having regularly organized local boards of health, and are hereby empowered to make all such regulations as they may deem necessary to protect the public health, and to enforce, in courts of justices of the peace, the same by the imposition of such penalties as come within the jurisdiction of a justice of the peace.

SEC. 18. *Water and water supply.*—The State Board of Health shall have the general oversight and care of all inland waters and shall from time to time, as it may deem expedient, cause examinations of the said waters to be made for the purpose of ascertaining whether the same are adapted for use as sources of domestic water supplies, or are in a condition likely to impair the interests of the public or persons lawfully using the same, or imperil the public health. For the purposes aforesaid it may employ such expert assistance as may be necessary.

SEC. 19. The said Board shall from time to time consult with and advise the boards of directors of all State institutions, the authorities of cities and towns, corporations or firms already having or intending to introduce systems of water supply, drainage or sewerage, as to the most appropriate source of supply, the best practicable method of assuring the purity thereof, or of disposing of their drainage or sewerage, having regard to the present and prospective needs and interests of other cities, towns, corporations or firms which may be affected thereby. All such boards of directors, authorities, corporations and firms are hereby required to give notice to said Board of their intentions in the premises and to submit for its advice outlines of their proposed plans or schemes in relation

to water supply and disposal of sewage, and no contract shall be entered into by any State institution, city or town for the introduction of a system of water supply or sewage disposal until said advice shall have been received and considered: *Provided, however*, that any city or town having a regularly organized Board of Health may seek advice therefrom or from its County Board of Health in lieu of that of the State Board.

SEC. 20. Whoever willfully or maliciously defiles, corrupts or makes impure any well, spring or other source of water supply or reservoir, or destroys or injures any pipe, conductor of water or other property pertaining to an aqueduct, or aids and abets in any such trespass, shall be guilty of a misdemeanor, and on conviction shall be fined not exceeding one thousand dollars or imprisoned not exceeding one year.

SEC. 21. Any householder in whose family there is to his knowledge a person sick of cholera or typhoid fever, who shall permit the bowel discharges of such sick person to be emptied without first having disinfected them according to the instructions to be obtained from the attending physician or the County Superintendent of Health shall be guilty of a misdemeanor, and upon conviction shall be fined not less than two nor more than twenty-five dollars, or imprisoned not less than ten nor more than thirty days. And in cases where such undisinfected discharges are emptied on the water shed of any stream or pond furnishing the source of water supply of any public institution, city or town the penalty shall be a fine of not less than twenty-five nor more than fifty dollars, or imprisonment for not more than thirty days. And any physician attending a case of cholera or typhoid fever who refuses or neglects to give the proper instructions for such disinfection as soon as the diagnosis is made shall be deemed guilty of a misdemeanor, and upon conviction shall be fined not less than ten nor more than fifty dollars.

SEC. 22. Whenever and wherever a nuisance upon premises shall exist which in the opinion of the County Superintendent of Health is dangerous to the public health, it shall be his duty to notify in writing the parties occupying the premises (or the owner, if the premises are not occupied) of its existence, its character and the means of abating it. Upon this notification the parties shall proceed to abate the nuisance, but failing to do this shall be adjudged guilty of a misdemeanor and shall pay a fine of one dollar a day dating from twenty-four hours after the notification has been served, the amounts so collected to be turned over to the County Treasurer: *Provided, however*, that if the party notified shall make oath or affirmation before a justice of the peace of his or her inability to carry out the directions of the Superintendent it shall be done at the expense of the town, city or county in which the offender lives. In the latter case the limit of the expense chargeable to the town, city or county shall not be more than one hundred dollars in any case: *Provided further*, that nothing in this section shall be construed to give

the Superintendent the power to destroy or injure property without a due process of law as now exists for the abatement of nuisances.

SEC. 23. *Vaccination.*—On the appearance of a case of small-pox in any neighborhood all due diligence shall be used by the Superintendent of Health that warning shall be given, and all persons not able to pay shall be vaccinated free of charge by him, and the County Superintendent shall vaccinate every person admitted into a public institution (jail, county home, public school) as soon as practicable, unless he is satisfied upon examination that the person is already successfully vaccinated; the money for vaccine to be furnished by the County Commissioners. The authorities of any city or town, or the Board of County Commissioners of any county, may make such regulations and provisions for the vaccination of its inhabitants under the direction of the local or county Board of Health or a committee chosen for the purpose, and impose such penalties as they may deem necessary to protect the public health.

SEC. 24. The Board of County Commissioners of each county is hereby authorized at any time to call a meeting of the County Board of Magistrates or Justices of the Peace to take into consideration the health interest of the people of their county, and, with the approval of the said Board of Magistrates, to levy a special tax to be expended under the direction of a committee composed of the Chairman of the Board of County Commissioners, the Mayor of the county town and the County Superintendent of Health for the preservation of the public health.

SEC. 25. The authorities of any city or town are hereby authorized, not already authorized in its charter, to make such regulations, pay such fees and salaries and impose such penalties as in their judgment may be necessary for the protection and the advancement of the public health.

SEC. 26. Bulletins of the outbreak of disease dangerous to the public health shall be issued by the State Board whenever necessary, and such advice freely disseminated to prevent and check the invasion of disease into any part of the State. It shall also be the duty of the Board to inquire into any outbreak of disease by personal visits or by any method the Board shall direct. The compensation of members on such duty shall be four dollars a day and all necessary traveling and hotel expenses.

SEC. 27. Special meetings of the State Board of Health may be called by the President through the Secretary. The regular annual meetings shall be held at the same time and place as the State Medical Society, at which time the Secretary shall submit his annual report.

SEC. 28. For carrying out the provisions of this act two thousand dollars, or so much thereof as may be necessary, are hereby annually appropriated, to be paid on requisition to be signed by the Secretary

and President of the State Board of Health; and the printing and stationery necessary for the board to be furnished upon requisition upon the State Printer. A yearly statement shall be made to the State Treasurer of all moneys received and expended in pursuance of this act.

SEC. 29. A contingent fund of five thousand dollars is hereby appropriated, subject to the Governor's warrant, countersigned and recorded by the Auditor of the State, to be expended in pursuance of the provisions of this act when rendered necessary by a visitation of cholera or any other pestilential disease.

SEC. 30. All previous acts conflicting with this act, and also all previous acts of appropriation for the public health, are hereby repealed upon the passage of this act: *Provided*, that nothing herein shall operate as a repeal or abridgment of powers conferred by any special act on any local Board of Health.

SEC. 31. That this act shall be in force from and after its ratification.

Ratified the 1st day of March, A. D. 1893.

On January 27th letters with new blanks to be used for monthly reports were sent to all County Superintendents and town reporters.

On March 10th a letter and blank were sent to every Clerk of the Superior court in the State asking for a list of all the registered physicians in each county.

On the 28th of March a second letter was sent to thirty-one Clerks who had not responded to first letter.

On April 4th a letter of acknowledgment, together with a copy of the "Laws Regulating the Practice of Medicine in North Carolina," was mailed to all Clerks who had sent in lists.

This letter explained to them the requirements for registration, as the lists showed some illegal registrations had been made.

While the administration of the laws regulating medical practice does not come technically within the jurisdiction of the Secretary of the State Board of Health it has a sufficient bearing on the health of the people, he thinks, to justify his action in availing himself of an opportunity to probably correct some errors in the registration of physicians that had

been made—and to prevent their occurrence in the future, by calling the attention of the Clerks of Court especially to the law as it now stands. It is gratifying to know that his efforts were appreciated, by some of the Clerks at any rate, and that one to his certain knowledge recalled certificates which under a misapprehension had been incorrectly issued.

In response to a call for a Conference of State Boards of Health to be held in New York on April 5, 1893, to consult upon the conditions of the quarantine stations of the country and other matters pertaining to keeping out pestilential diseases, the President and Secretary attended as delegates from this Board.

The principal business accomplished by this Conference over and above the good resulting from personal contact and interchange of ideas is set forth in the published report of the Secretary of that body.

On April 12th your Secretary received this letter:

WILMINGTON, N. C., April 11, 1893.

Dr. R. H. Lewis, Secretary State Board of Health, Raleigh, N. C.,

DEAR DOCTOR:—The Quarantine Board of the port of Wilmington respectfully submit that, in view of the opinion expressed by the Conference of Health Officers that the emergency demanded the erection and operation of disinfecting plants at seaport towns, the State Board of Health take up the question and consider the advisability of making available the appropriation made for this port by the last Legislature.

Respectfully,

GEO. GILLETT THOMAS,

Secretary Board of Quarantine, Port of Wilmington, N. C.

In consequence thereof I addressed the following letter to each member of the Board of Health, inclosing a copy of Dr. Thomas's letter with an abstract of the minutes of the Conference and of the legislative act making the appropriation:

RALEIGH, N. C., April 14, 1893.

DEAR DOCTOR:—I have just received the following letter from the Secretary of the Board of Quarantine of the port of Wilmington: "The Quarantine Board of the port of Wilmington respectfully submit that, in view of the opinion expressed by the Conference of Health Officers that the emergency demanded the erection and operation of disinfecting plants at seaport towns, the State Board of Health take up the question and consider the advisability of making available the appropriation made for this port by the last Legislature."

The following is an extract from a report of the proceedings of the Conference: "Dr. H. B. Baker, of Michigan, offered the following, which was unanimously adopted: '*Resolved*, That in the present emergency every State maintaining a maritime quarantine should possess a perfectly equipped station with all appliances necessary for thorough disinfection of infected vessels, unless there are special reasons to the contrary.' The last clause was added to cover the case of States like New Jersey, which can avail themselves of the stations of neighboring States."

As this is a matter of urgent importance, in order to save delay and the necessity of a special meeting of the Board so near the time of the regular meeting on the 10th prox., I would thank you for an immediate expression of opinion by letter on the question. If a majority of the Board reply in the affirmative, and the Governor approves, the Quarantine Board would feel authorized to give out the contracts at once, and more regular action could be taken by the Board of Health when it meets, if deemed necessary.

The facts on which the above letter is based are these: The last Legislature appropriated $20,000 for a modern disinfecting plant at Southport, which now has none at all, but attached the condition that the money should not be available until "in the opinion of the Governor and the State Board of Health the entrance of cholera into the port is imminent." Upon the construction of the word "imminent" hangs the decision. In Worcester's Comprehensive Dictionary the word "imminent" is defined "impending; threatening; near," the only meanings given. In the opinion of the recent Conference alluded to in the letter quoted cholera is "impending; threatening; near," as it doubtless is in the opinion of nearly every other person of any sanitary experience, owing to our constant intercourse with western Europe. In this case the word imminent could not be taken to mean something "about to fall on the instant," for it would be manifestly absurd to wait until a ship with cholera on board had entered the mouth of the Cape Fear before giving out the contract for apparatus requiring two or three months for its construction to prevent the entrance of the disease. So that in the opinion of the undersigned, as well as of two other members of the Board with whom he has

spoken, "the danger of the entrance of cholera into the port of Wilmington is imminent" in the sense in which the word can alone be reasonably applied to the case in hand. Please let me know by return mail whether you agree or disagree with that opinion. Not a day is to be lost if any thing is to be done.

Very truly yours,

RICH'D H. LEWIS,
Secretary.

To this letter replies were received from all the members, only one opposing the appropriation. As soon as a majority had been heard from, realizing the importance of getting to work on the Quarantine Station at the earliest possible moment, I wrote to his Excellency Governor Carr, who was then at Rocky Mount, which letter was delayed in reaching him. Immediately upon his return to the capital I laid the matter with the correspondence before him. He appointed an hour the same afternoon for me to call for his decision, but before it arrived he was unexpectedly summoned to Newbern. On his return, having received replies from every member of the Board, I addressed to him this communication:

MAY 4, 1893.

His Excellency Elias Carr, Governor of North Carolina,

SIR:—Since my communication of the 17th ult., addressed to you at Rocky Mount, stating that "replies from a majority (of the Board of Health) expressing the opinion that 'the entrance of cholera into the port of Wilmington as imminent' had been received," I have heard from every member. The replies from eight are as above, and from one to the effect that the entrance of cholera is no more imminent now than at the time of the passage of the act. I beg to dissent from that opinion, for the reason that a number of fresh cases have occurred on the west coast of Europe since the adjournment of the Legislature, and sanitarians now consider the outlook for the summer very gloomy.

The Quarantine Board of Wilmington now awaits the concurrence of your Excellency in the opinion of the State Board of Health, as required by the act, before beginning this work of such great importance in protecting the port and State from the scourge which threatens us. With great respect, Your obedient servant,

RICH'D H. LEWIS,
Secretary.

To this letter the Governor replied as follows:

MAY 1, 1893.

Dr. Richard H. Lewis, Secretary N. C. Board of Health, Raleigh, N. C.

DEAR SIR:—Replying to your kind favor of the 1st instant, I would state, in accordance with your views and the other members of the State Board of Health, and after viewing the situation as it is, that, section 2 of the act to amend section 2915 of The Code as follows: "For the purpose of carrying into effect the provisions of section 2915 as herein amended the sum of twenty thousand ($20,000) dollars is hereby appropriated out of any moneys in the State Treasury not otherwise appropriated, to be paid from time to time, as required in the prosecution of the work, on the requisition of the Treasurer of the Quarantine Board and approved by its President: *Provided*, that the funds appropriated by this act shall not be paid over by the Treasurer until the Governor and State Board of Health of North Carolina shall certify to the Treasurer that there is imminent danger of cholera visiting the city of Wilmington or other sections of the State," makes it my plain duty to inform you that the amount appropriated ($20,000) is now available, and can be used in carrying out the provisions of the act.

With highest esteem, I am, Yours very truly,

ELIAS CARR,
Governor.

I immediately wired the Secretary of the Quarantine Board of Wilmington:

Governor approves. Go ahead. R. H. LEWIS,
Secretary.

Afterwards I wrote him as follows:

MAY 2, 1893.

Dr. Geo. G. Thomas, Secretary Board of Quarantine, Port of Wilmington.

MY DEAR DOCTOR:—In compliance with your communication of the 11th ult., calling upon the State Board of Health to "take up the question and consider the advisability of making available the appropriation made for the port by the last Legislature," I addressed a letter setting forth the facts to each member of the Board. Replies from all were duly received—eight voting in favor and one against complying with the condition necessary to make the appropriation available.

The whole correspondence was laid before his Excellency, the Governor, at the earliest opportunity, and to-day I received his decision. I inclose his letter, which, after submitting it to your Board, you will please return and oblige,

Yours truly,

RICH'D H. LEWIS, M. D.,
Secretary.

While the securing of a quarantine station with all the modern improvements for our chief seaport, a work of the highest value, from a sanitary point of view, to the State, cannot be credited to our Board, it is gratifying to know that the leader in that movement was one of our members, Dr. George G. Thomas, who was most ably assisted by Dr. T. S. Burbank, Messrs. J. C. Stevenson, Alex. Sprunt and others. Thanks to their efforts and to our enlightened and progressive Legislature North Carolina will soon be abreast of the most advanced communities in the matter of maritime quarantine protection.

In the performance of the duty imposed upon me in Section 9 of the Act Relating to the Board of Health I prepared the following pamphlet containing Instructions for Quarantine and Disinfection:

INSTRUCTIONS FOR QUARANTINE AND DISINFECTION.

EXTRACT FROM SECTION NINE OF AN ACT RELATING TO THE BOARD OF HEALTH, RATIFIED MARCH 1, 1893.

"Inland quarantine shall be under the control of the County Superintendent of Health, who shall see that diseases especially dangerous to the public health, viz.: small-pox, diphtheria, scarlet fever, yellow fever, typhus fever and cholera, are properly quarantined and isolated within twenty-four hours after the case is brought to his knowledge; and that after the death or recovery or removal of a person sick of either of the diseases mentioned, the rooms occupied and the articles used by the patient are thoroughly disinfected in the manner set forth in the printed instructions, both as to quarantine and disinfection, which shall be furnished him by the Secretary of the State Board of Health. The expense of the quarantine and of the disinfection shall be borne by the householder in whose family the case occurs, if able, otherwise by the city, town or county of which he is a resident. * * * Any person neglecting or refusing to comply with or in any way violating the rules promulgated in the manner above set forth on the subjects of quarantine and disinfection shall be deemed guilty of a misdemeanor, and upon conviction shall be fined or imprisoned, at the discretion of the court, not less than five nor more than fifty dollars, or less than ten nor more than thirty days. * * * In any city or incorporated town having a regularly appointed medical health officer who is a member of the County Board of Health, the duties assigned in this section to the County Superintendent of Health shall be performed by the said medical health officer for the people of his city or town. * * * "

1. Every person sick of either of the diseases mentioned in the above extract from section nine should be immediately isolated, with his nurses, in a separate room, if there is one, and nothing should be taken out of

such room at any time without having been previously disinfected in the manner described under the head of disinfection. The mildness of the attack must not be permitted to beget laxity in carrying out these instructions.

2. When any of the diseases mentioned above occurs in a house containing only one room, the house and all persons residing therein should be quarantined. The same rule should apply to the entire house, even if of sufficient size to permit the isolation of the sick person and his nurses in a separate room, in cases of small-pox, cholera, yellow fever, and typhus fever; but in cases of scarlet fever and diphtheria the quarantine need extend only to the room occupied by the patient and his nurses and to the occupants thereof. Whenever possible persons sick of small-pox, cholera, typhus fever or yellow fever should be immediately removed to quarters specially provided for the detention and treatment of such cases. Particular care should be taken to quarantine for a time sufficiently long to insure safety to others all persons who were exposed to infection before the removal of the patient.

3. When a house or room is in quarantine no one whatever except the attending physician and the clergyman of the family should be admitted. The person doing the outside service for a quarantined family should take orders verbally from a distance, and should lay down at the entrance of the house or room any articles he may bring there. No pet dog or cat should be allowed in the room.

4. When either of the diseases mentioned has declared itself in a house no work for trade purposes or for private families should be taken in by any one inhabiting the same, and all such work as may have been taken in before the outbreak of the disease should be disinfected before being sent home.

5. No person recovering from either of these diseases, and no person who has nursed such a patient, should quit the house before receiving a certificate from the County Superintendent of Health, municipal medical health officer, or attending physician, that the precautions required under the head of disinfection have been taken. Children must have certificate before re-entering school. See section 13 of the law.

6. No person residing in a quarantined house should go beyond the lot (or farm, provided there be no other persons living thereon) or put himself in direct communication with any one from outside.

7. When a house is quarantined any person residing therein, other than the patient, who wishes to leave for the purpose of changing his residence, may do so with the written permission of the County Superintendent of Health or municipal medical health officer, provided he takes all the precautions required under disinfection.

8. The body of every person who has died of either of the diseases mentioned should be disinfected in the manner described below. It

should be kept isolated up to the moment of the funeral in the room occupied by such person during his illness. The funeral should take place as soon as possible, and in all cases be private, attended only by those absolutely necessary to the proper performance of the burial, unless the body having been disinfected be in a metal coffin hermetically sealed. Children should under no circumstances be present.

9. When there is a case of either of the diseases mentioned in a house a placard stating the name of the disease, to be furnished by the County Superintendent of Health, shall be posted on the front door of said house. This placard must not be removed in any case until the premises have been properly disinfected, and then only by the County Superintendent of Health or municipal medical health officer in person, or by express permission of the same.

DISINFECTION.

I. DURING THE CONTINUANCE OF THE DISEASE.

(*a*). All the sunlight possible and as much fresh air as the nature of the disease and the state of the weather will permit should be admitted to the sick-room.

(*b*). *The expectorations and excretions of the patient* should be received in vessels in which there is a considerable quantity of bichloride of mercury, solution No. 2, or milk of lime, or an equal quantity of either of them should be added thereto and the mixture allowed to stand at least a half hour before throwing into the water-closet, if the house be connected with a system of sewers, or, otherwise, should be buried at a distance of not less than 100 feet from any well or spring.

(*c*). *Soiled body and bed-clothing, handkerchiefs, rags, etc.*, should, as soon as discarded, be immediately burned or immersed in a vessel of sufficient size, containing enough of the zinc or chloride of lime solution to completely cover them, and kept there until they can be thoroughly boiled for not less than a half hour in plain water, or better the zinc solution, and then washed and dried in the sun.

(*d*). The remains of the food served to the patient should be burned in the room or soaked in one of the disinfecting solutions mentioned and then buried.

II. AFTER THE RECOVERY, REMOVAL OR DEATH OF THE PATIENT.

(*a*). *Of the articles used and room occupied by the patient.* The vessels should be washed with a disinfecting solution. Burn in a hot fire sufficiently fierce to consume quickly and completely such articles as are not too valuable. Others that can be boiled without injury should be boiled hard for not less than a half hour, then thoroughly washed and dried in the sun. The remainder—furniture, curtains, woolen clothes, pillows, beds, mattresses (the contents of mattresses when straw, shucks or other

cheap material should be burned and the ticks boiled) and all other articles which have been exposed to the infection should be hung on racks, or otherwise loosely distributed about the room, so as to permit free access of the gas to every part, the carpet, if there be one, being left on the floor, and then disinfected at the same time with the room by sulphur fumigation. Afterwards they should be taken into the open air and thoroughly beaten and sunned.

If preferred, in cases where every article in the room can be subjected to the process to be named, or when the room cannot be made tight enough to retain the sulphur fumes, every article in the room which can be should be boiled and the remainder, including the floor and woodwork, should be well washed with the bichloride solution No. 1. The walls and ceiling should have the same solution *thoroughly* applied to them or be well whitewashed.

(*b*). *Of the person of the recovered patient.* Wash the body, including the hair, with the bichloride solution No. 1 and put on clean clothes that have not been in the sick-room or that have been disinfected as prescribed in 1 (c).

(*c*). *Of the dead body.* Wrap the body in a well-sewed sheet thoroughly saturated with the bichloride solution No. 2 or with the chloride of lime solution. Put two pounds of chloride of lime in the coffin.

(*d*). *Of persons before leaving a house which has been quarantined.* Wash at least the uncovered portions of the body—hands, face, beard and hair—better the entire body—in the bichloride solution No. 1 and put on clean clothes that have not at any time been exposed to the infection or have been disinfected in the manner described. The notice of the attending physician and visiting clergyman is called to the importance of their observing these precautions and at least washing their hands in the bichloride solution the last thing before leaving the room.

(*e*). *Of a vehicle used to carry the body, living or dead, affected with either of the diseases enumerated.* Remove all cushions, curtains and other accessories and disinfect by boiling or soaking in the bichloride solution No. 1 and wash out the interior with bichloride solution No. 2.

DISINFECTANTS.

1. *Bichloride of mercury, solution No. 1.* Bichloride of mercury 1 dracham, water 1 gallon.

2. *Bichloride of mercury, solution No. 2.* Two drachms to the gallon.

Owing to its poisonous character a solution of bichloride should be colored with bluing to prevent mistakes. It should be kept in earthen or wooden vessels, as it corrodes metals.

3. *Zinc solution.* Sulphate of zinc (white vitriol) 4 ounces, salt 2 ounces, water 1 gallon.

4. *Chloride of lime solution.* Fresh chloride of lime 6 ounces, water 1 gallon.

5. *Milk of lime (whitewash).* Pour on 1 quart of quick-lime, broken into small pieces, 1 quart of water. As soon as reduced to powder add 3 quarts of water. Store in well-closed vessel. Make fresh supply every few days, as it does not keep well. Can be kept much longer by pouring one-half cup of kerosene on top to exclude air.

6. *Sulphur fumigation.* The room must be vacated. Close as tightly as possible every opening, fire-place by stuffing throat of chimney with old bags or plenty of straw; cracks around doors and windows by calking with tow or cotton, etc. Place small lumps or powdered sulphur, in the proportion of 3 pounds for every 1,000 cubic feet of air space to be disinfected, in an iron pot or pan free from cracks. Set the vessel, if it has no legs, on bricks in the bottom of a tub containing 2 or 3 inches of hot water (to put out fire in case burning sulphur should leak out or overflow); light with red-hot coals or by pouring on a tablespoonful of alcohol and applying a match. Be careful not to inhale the fumes. Close the door of exit as tight as possible. Keep the room closed for twelve hours, except in cases where family has no other room to sleep, then six hours. Then open all doors and windows and air thoroughly.

NOTE.

It is practically established that if the instructions given in this circular are faithfully carried out these justly dreaded diseases will not spread. Such being the fact the responsibility of those whose duty it is to carry them out is great.

A positive promise from the attending physician to the County Superintendent of Health, or to the municipal medical health officer, to see that the instructions are faithfully carried out would relieve the latter of responsibility.

The County Superintendent of Health or the municipal medical health officer should not fail to promptly furnish to both the attending physician and the householder in whose family either of the diseases mentioned in section 9 occurs a copy of these instructions.

Any further information desired will be cheerfully furnished.

RICHD H. LEWIS, M. D.,
Secretary.

A copy of these instructions, together with a copy of the new law, was mailed to every registered physician in every county in North Carolina except four, from the Clerks of which no reply has been received to either of my two letters: I shall write them again.* The total number

*The list of physicians has been made complete, and the instructions were promptly distributed.

mailed so far is 1,517. The "instructions" in quantity will be sent to all County Superintendents and municipal health officers. With them will be sent the placards required to be posted on the front door of every house containing a case of either of the diseases mentioned in section nine.

Continuing the plan of trying to educate the people in sanitary matters by popular articles in the newspapers, I sent an article, together with a copy of the Instructions for Quarantine and Disinfection, to every newspaper in the State with a request that they publish same.

Just on this line members of the profession can be of great assistance, provided they approve of the plan and the articles, by using their influence with the editors of their local papers to get them to publish them. A public sentiment favorable to sanitation must be built up if we expect to make any substantial progress. The Anglo-Saxon people of this free country cannot be driven to the performance of what they do not approve. They must be persuaded of the importance of these restraints upon their liberties under certain circumstances before they can be successfully imposed.

But the physicians of the State can be of much greater service to the cause of the public health in another way, and that is by giving to the law and the sanitary regulations imposed by it their own cordial support. Indeed the practical application of the law is in the hands of our medical men. If they give it their cordial support and urge its importance upon their patients it will be carried out, but if they are indifferent, and make light of and belittle it it will surely be largely of no effect. In view of the wholesale danger to life of the spread of contagious and infectious diseases, which can almost surely be prevented by the strict enforcement of sanitary regulations,

this is no light responsibility which rests upon us, whether we are willing to assume it or not.

Section 19 of the law requires all State institutions before adopting a system of water supply and sewerage to consult the State Board of Health. In compliance with that requirement the President of the Board of Directors of the proposed School for the Deaf and Dumb at Morganton addressed the following letter to the President of the Board of Health:

BILTMORE, N. C., March 31, 1893.

Dr. Henry T. Bahnson, Salem, N. C.

DEAR SIR:—I see that the Laws of 1893 make it the duty of the Board of Health of the State of North Carolina to consult and advise with all the State institutions already having or intending to introduce systems of water supply, drainage, or sewerage. The Board of the Deaf and Dumb School at Morganton are considering their water supply; we are considering two ways of furnishing same. One by gravitation, and to get it would have to lay a line of pipe about four miles at a cost of from $12,000 to $15,000, which is more money than the Board can pay if we can get that which will answer cheaper. We also have under consideration the "Gang Well" system, which, if it is thought it will work well and the quality of the water is all right, will be a great deal cheaper. This system we will have ample means of testing, as the Morganton Tannery is putting in a gang well on adjoining property to that of the institution. I do not think there will be a doubt as to quantity if the quality is what is desired. I go into the details so you can the better advise us, and to do this would be glad to have you with us at our next Board meeting on the 14th April. The sewage from the building will be conducted in the usual sewage pipe one-half mile from building, emptying into a creek with a fall of about one hundred and fifty feet.

Hoping to hear from you on the subject, or, better, see you at our meeting, I am very truly,

M. L. REID,
Chairman Board Deaf and Dumb School.

In accordance therewith a committee composed of Drs. H. T. Bahnson and S. Westray Battle visited Morganton, examined carefully into the matter and made the following report:

MAY 5, 1893.

To the Honorable Board of Directors
Deaf and Dumb School at Morganton, N. C.

GENTLEMEN:—The committee appointed by the North Carolina Board of Health, in compliance with your request, to examine and advise your honorable body relative to a water supply and sewerage system for the Deaf and Dumb School at Morganton, N. C., beg to submit the following report:

A careful inspection of the site and surroundings has satisfied us that the sewage of the institution should be emptied directly into Hunting creek. The smaller stream to the rear of the school is objectionable on account of its limited water supply, and its liability to overflow *during freshets* and deposit the sewage on the lowlands in its course. The prevalent westerly winds would thence convey its unpleasant and perhaps noxious effluvia to the institution. Hunting creek furnishes so large a volume of water that this menace is entirely avoided, and a conduit in a direct line, with ample and uninterrupted fall, would cost very little more.

The water supply presents a more difficult problem. While there is no doubt in our minds that a pipe line from a mountain stream, whose water shed could be owned and protected by the authorities of the institution, would furnish the best and safest supply, the great cost practically prohibits its adoption. A system of gang wells has been successfully employed by the large tannery on the adjoining property, which furnishes very much more water than will ever be required by your institution. This water is apparently pure and the plant required an outlay of less than one-fourth of the amount which a pipe line from the mountain would cost.

The site in the rear of the school is apparently favorable for the adoption of a similar system. Water obtained here would probably be free from mineral impurity, and the danger of contamination is so remote that it can safely be left out of consideration.

Under the circumstances we cannot hesitate to recommend that an attempt be made to obtain a water supply from this source.

Very respectfully,

HENRY T. BAHNSON, M. D.,
S. WESTRAY BATTLE, M. D.,
Committee.

It needs no argument to prove that the greatest danger from contagious and infectious diseases is where numbers of people are congregated together in close quarters, and therefore that the machinery for combating them should be

made as near perfect as possible in the cities and towns. To that end the organization of local municipal Boards of Health is a necessity. Section 25 of the law confers full powers upon all municipal corporations to make such regulations and impose such penalties for the preservation of the public health as they may deem necessary; but the matter is always optional with them. In the hope of inducing as many as possible to organize Boards of Health with the necessary powers, I have prepared the following letter to be sent to the Mayors of all towns of more than 500 inhabitants:

RALEIGH, N. C., May 8, 1893.

His Honor the Mayor,

DEAR SIR:—The warm weather is upon us and it is time for those of us upon whom rests the responsibility of looking out for the protection of the health of the people to be bestirring ourselves. Whenever there is a Board of Health organized it is clearly its duty; but otherwise, in cities and towns, it falls upon the Mayor and Board of Aldermen or Town Commissioners. It is best, however, to have a body whose special duty it is, and therefore it is expressly desirable that Boards of Health should be formed in all towns where they do not already exist. This is particularly the case just at this time, since the entrance of cholera into our country this summer is regarded as more than probable.

Have you a Board of Health in your town? If so, will you be kind enough to send in the names of its officers and a copy of its sanitary regulations? If not, will you not exert yourself to secure the formation of one as soon as possible? If desired, I would take pleasure in forwarding to you, free of charge, model ordinances, blanks, etc. Your aid in this important matter is asked in the interest of your own people, chiefly, but also for the sake of other citizens of the State who might incur disease from your town if the proper and necessary sanitary precautions are neglected.

Your kind attention will oblige,

Yours very respectfully,

RICH'D H. LEWIS, M. D.,

Secretary.

The subjoined letter, inclosing model ordinance, blanks, etc., was sent to every county-seat and other town of more than five hundred inhabitants:

RALEIGH, N. C., June 9, 1893.

The Honorable Mayor and Board of - - - - - - - - ,

GENTLEMEN:—I send herewith a copy of the Act Relating to the Board of Health (Chapter 214, Laws of 1893), a model health ordinance, based chiefly on the admirable one issued by the Pennsylvania Board of Health, and various blanks which explain themselves. I hope that you will adopt and enforce them, thereby materially advancing the cause of public health and *pari passu* the prosperity of your town. The ordinance may strike you as being rather voluminous, but a careful consideration of the same will, I think, show the reasonableness and importance of each section. Still, if deemed necessary, it can be modified to suit the particular conditions of your town, though I would be glad to have it adopted as it stands in order to secure a uniform system in every town in the State.

In cities and towns where people are more or less crowded together, and the danger of contamination of air and drinking water and of the spread of communicable diseases from person to person is in consequence greatly increased, the practical application of sanitary laws is especially important. The collection of vital statistics, particularly those relating to the cause of death, should be carefully looked to in order to ascertain those most prevalent, with a view to taking special precautions against them in the future. It is also of great importance from a material point of view. One of the first inquiries made by intending immigrants is in regard to the healthfulness of their contemplated destination, and that information would be sought for at this office. To give an opinion I must be assured of their *completeness* and *accuracy*. Those two essentials cannot be obtained unless the method recommended is faithfully carried out, viz., the positive refusal to allow the body of any one dying in the town to be buried or removed without a permit from a designated official, based upon a properly filled out and signed death certificate giving the cause of death; or some other method equally as reliable. The healthfulness of our State is one of its greatest attractions, and the only way to demonstrate it to strangers in these days of scientific accuracy is by means of reliable vital statistics. In our present stage of sanitary development these statistics can only be obtained from our cities and towns, and I trust you will help your own immediate home and, at the same time, aid me in showing to the world our advantages in this most important item of health.

Any further assistance in my power would be most gladly rendered by.

Yours very respectfully,

RICH'D H. LEWIS, M. D.,

Secretary.

ORDINANCE OF THE ..... OF.....
FOR THE BETTER PRESERVATION OF THE PUBLIC HEALTH AND TO PREVENT THE SPREAD OF COMMUNICABLE DISEASES.

In virtue of the powers conferred by section 25, chapter 214, Laws of 1893 of the State of North Carolina, be it ordained by the*..... of the† ..... of....., and it is hereby ordered by the authority of the same—

SECTION 1. That the Mayor‡.....shall constitute a Local Board of Health for the†..... of....., whose duty it shall be to faithfully execute all Laws of the State (chapter 214, Laws of 1893—An Act Relating to the Board of Health) and all ordinances relating to the public health of the† ..... of..... The Board of Health shall have power to make all necessary rules and regulations for the promotion and preservation of the public health and the collection and registration of vital statistics within the†..... of..... subject to the ratification of the*..... A majority of the members shall constitute a quorum.

SEC. 2. The Mayor shall be *ex officio* President of the Board of Health. He shall convene the Board in regular session on the first¶..... in each month from April to October inclusive, and quarterly thereafter, and shall have power to call the said Board together in extra session whenever, in his judgment or in that of the health officer, the public health demands it.

SEC. 3. The medical member‖ of the Board shall be *ex officio* the health officer of the†..... , and shall be the executive officer of the

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*Insert City Council, Board of Aldermen or Board of Town Commissioners, as the case may be.

†City or Town.

‡*For small towns* insert "the Town Clerk and the County Superintendent of Health" (if that official is a resident of the town and acceptable to the town authorities), otherwise insert "the Town Clerk and a resident registered physician to be elected by the Board of Town Commissioners."

For larger towns insert "the Town Clerk and three resident registered physicians to be elected by the Board of Town Commissioners." If preferred insert "the Town Clerk and three other persons, one of whom shall be a resident registered physician to be elected, etc."

For cities insert "Chief of Police, City Attorney, Chairman of the Sewer Committee, Chairman of the Water Committee, Chairman of the Street Committee and County Superintendent of Health" (if he be a resident of the city), otherwise "a resident registered physician to be elected by the Board of Aldermen." Perhaps it might be better to insert after City Attorney "the County Superintendent of Health and three other resident registered physicians to be elected by the Board of Aldermen."

¶Insert day of week.

‖Where there is more than one medical member of the Board substitute "The medical member of the Board receiving the highest number of votes shall be the health officer."

Board. He shall perform for the*_____ the duties of the County Superintendent of Health as laid down in Chapter 214, Laws of 1893, and such other duties as may be imposed by the Board, including the collection of vital statistics, which he shall use every effort to make as full and accurate as possible, especially such as relate to the cause of death. He shall notify the Secretary of the State Board of Health of his election and shall make such reports and answer such inquiries concerning the sanitary condition of the†_____, diseases prevalent, vital statistics, etc., as may be required by the State Board of Health. He shall hold his office for _____ years, and until his successor is appointed and has qualified.

SEC. 4. The*_____Clerk shall be *ex officio* Secretary of the Board. He shall keep a full and accurate record of all business done at its meetings. He shall cause to be published in the newspapers of the*_____ and by printed or written notices, to be posted in†_____, all orders, rules and regulations of the Board, which publication shall be deemed legal notice of the same to all persons. He shall file and keep for reference all reports, complaints, orders or other papers relating to the business of the Board. He shall also keep, in a book provided for the purpose, a full and complete record in detail of all vital statistics.

SEC. 5. The Board of Health may, with the approval and consent of the Board of‡_____elect a special¶_____, or use one of the regular force, who shall be known as the Sanitary Inspector. He shall inspect at least once in every month, from April to October inclusive, the premises of every householder in the*_____. He shall make a note of and report in writing to the health officer any violations of the orders, rules and regulations promulgated by the Board, and shall serve such legal notices as the Board may direct. His term of office and compensation shall be fixed by the Board of‡_____.

SEC. 6. The Board of Health, through its health officer, shall make a report annually in March, for the preceding twelve months ending with the last day of February, to the Board of‡_____.

SEC. 7. Whatever is dangerous to human life or health, whatever renders the air or food or water or other drink unwholesome, and whatever building, erection, or part or cellar thereof, is overcrowded or not provided with adequate means of ingress and egress, or is not sufficiently supported, ventilated, drained, cleaned or lighted, are declared to be nuisances, and to be illegal; and every person having aided in creating or contributing to the same, or who may support, continue or retain any of them, shall be deemed guilty of a violation of this ordinance, and also be liable for the expense of the abatement and remedy therefor.

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*City or Town. †Insert number and location of public places.
‡Town Commissioners or Aldermen. ¶Constable or policeman.

SEC. 8. No house-refuse, offal, garbage, dead animals, decaying vegetable matter or organic waste substance of any kind shall be thrown on any street, road, ditch, gutter or public place within the limits of this _____, and no putrid or decaying animal or vegetable matter shall be kept in any house, cellar or adjoining out-building or grounds for more than twenty-four hours.

SEC. 9. No person or persons without the consent of the Board of Health* shall build or use any slaughter-house within the limits of this _____, and the keeping and slaughtering of all cattle, sheep and swine and the preparation and keeping of all meat, fish, birds, or other animal food, shall be in the manner best adapted to secure and continue their healthfulness as food; and the keeping of the premises shall be with such care and cleanliness as not to endanger the public health. No meat, fish, birds, fowls, fruit, vegetables, milk, and nothing for human food not being then healthy, fresh, sound, wholesome, fit and safe for such use, nor any animal or fish that died by disease or accident, and no carcass of any calf, pig or lamb which at the time of its death was less than four weeks old, and no meat therefrom, shall be brought within the limits of this _____, or offered or held for sale as food anywhere in said _____.

SEC. 10. No person or company shall erect or maintain within the limits of this _____ any manufactory or place of business dangerous to life or detrimental to health, or where unwholesome, offensive or deleterious odors, gas, smoke, deposit or exhalations are generated, such as tanneries, refineries, manufactories of starch, glue, leather, chemicals, fertilizers, gas, etc., without the permit of the Board of Health,* and all such establishments shall be kept clean and wholesome so as not to be offensive or prejudicial to public health.

SEC. 11. The keeper or keepers of a livery or other stable shall keep his or their stable-yard clean, and shall not permit, between the first day of April and the first day of November, more than _____ loads of manure to accumulate in or near the same at any one time except by express permission of the Board of Health.*

SEC. 12. No pig-pen shall be built or maintained within the limits of this _____ without a permit from the Board of Health,* or within one hundred feet of any well or spring of water used for drinking purposes, or within thirty feet of any street or of any inhabited house, or unless constructed in the following manner, viz., so that the floor of the same shall be not less than two feet from the ground in order that the filth accumulating under the same may be easily removed; and such filth accumulating in, about and under the same shall be removed at

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*Where there is no Board of Health organized substitute "Board of Town Commissioners" or "Board of Aldermen."

least once a week, and oftener if so ordered, and on the failure of any owner or occupier of such premises so to do, then the same shall be done by the ------ ---.

SEC. 13. No privy-vault, cess-pool or reservoir, into which a privy, water-closet, cess-pool or stable or sink is drained, shall be constructed, dug or permitted to remain within the corporate limits of this
Earth privies and earth closets, with no vault, pit or depression below the surface of the ground, are allowed, but sufficient dry earth or ashes must be used daily to absorb all the fluid part of the deposit, and the contents must be completely removed at least once every month.*

SEC. 14. The following diseases are declared to be communicable and dangerous to the public health, viz.: small-pox (variola, varioloid), cholera (Asiatic or epidemic), scarlet fever, (scarlatina, scarlet rash), measles, diphtheria (diphtheritic croup, diphtheritic sore throat), typhoid fever, typhus fever, yellow fever, spotted fever (cerebro-spinal meningitis), epidemic dysentery, hydrophobia (rabies) and glanders (farcy), and shall be understood to be included in the following regulations, unless certain of them only are specified.

SEC. 15. Whenever any householder knows that any person within his family or household has a communicable disease, dangerous to the public health, he shall, within twenty-four hours, report the same to the health officer,† giving the street and number or location of the house.

SEC. 16. Whenever any physician finds that any person whom he is called upon to visit has a communicable disease, dangerous to the public health, he shall, within twenty-four hours, report the same to the health officer,† giving the street and number or location of the house, on the receipt of which report the health officer shall immediately notify the school committee of the public school, the superintendent of the graded school and the principals of private schools within the limits of this ----------, at the same time calling their attention to Section 13, Chapter 214, Laws of 1893.

SEC. 17. No person shall, within the limits of this ------ ----, unless by permit of the health officer,‡ carry or remove from one building to another any patient affected with any communicable disease dangerous to the public health. Nor shall any person, by any exposure of any individual so affected, or of the body of such individual, or of any

*To towns and cities having already or about to introduce a system of sewerage suggestions as to the proper ordinances will be gladly furnished by the Secretary of the State Board of Health.

†Where there is no medical health officer insert "County Superintendent of Health as required by chapter 214, Laws of 1893.

‡Where there is no Board of Health insert "County Superintendent of Health."

article capable of conveying contagion or infection, or by any negligent act connected with the care or custody thereof, or by a needless exposure of himself or herself, cause or contribute to the spread of disease from any such individual or dead body.

SEC. 18. There shall not be a public or church funeral of any person who has died of Asiatic cholera, small-pox, typhus fever, diphtheria, yellow fever, scarlet fever or measles, within the limits of this..... and the family of the deceased shall in all such cases limit the attendance to as few as possible, and take all precautions possible to prevent the exposure of other persons to contagion or infection; and the person authorizing the public notice of death of such person shall have the name of the disease which caused the death appear in such public notice.

SEC. 19. No person shall let or hire any house, or room in a house, in which a communicable disease, dangerous to the public health, has recently existed, until the room or house and premises therewith connected have been disinfected to the satisfaction of the Board of Health,* in accordance with the "Instructions for Quarantine and Disinfection" furnished by the Secretary of the State Board of Health; and for the purposes of this section the keeper of a hotel, inn, or other house for the reception of lodgers, shall be deemed to let or hire part of a house to any person admitted as a guest into such hotel, inn or house.

SEC 20. Members of any household in which small-pox, diphtheria, scarlet fever or measles exists shall abstain from attending places of public amusement, worship or education, and from visiting other private houses except on express permission of the health officer.*

SEC. 21. The clothing, bed-clothing and bedding of persons who have been sick with any communicable disease, dangerous to the public health, and the articles which they have used and the rooms which they have occupied during such sickness shall be disinfected under the direction of the Board of Health* in accordance with the "Instructions for Quarantine and Disinfection" furnished by the Secretary of the State Board of Health.

SEC. 22. Upon the appearance of a case of small-pox in†..... county it shall be the duty of every adult and every parent, guardian or master of every minor residing within the limits of this....., who has not had small-pox or been vaccinated so as to have taken cow-pox regularly, to be, if an adult, vaccinated, or in the case of a minor, to cause such minor to be vaccinated within two weeks after the appear-

*Where there is no Board of Health insert "County Superintendent of Health."

†Insert name of county in which town or city is situated, or if preferred substitute "within a radius of..... .....miles."

‡City or town.

ance of such case of small-pox unless unable to do so by reason of poverty; and it shall be lawful for any registered physician residing in this* ----- - - --, on application of such resident adult, or parent, master or guardian of such resident minor, as is unable by reason of poverty to pay the vaccination fee, to vaccinate said adult or said minor and present his bill therefor, properly authenticated, for an amount not exceeding the fee usually charged for such services, and to recover the same of and from the corporation.†

SEC. 23. Every undertaker or other person who may have charge of the funeral of any dead person shall procure a properly filled out certificate of the death and its probable cause, in accordance with the form prescribed by the State Board of Health (no other to be valid), and shall present the same to the designated officer or member of the local Board of Health and obtain a burial or transit permit thereupon at least twenty-four hours before the time appointed for such funeral or removal; and neither he nor any other person shall remove any dead body until such burial or transit permit shall have been procured.

SEC. 24. Every person undertaking preparations for the burial of a body dead from communicable disease as hereinbefore enumerated shall adopt such precautions as are set forth in the "Instructions for Quarantine and Disinfection," furnished by the State Board of Health, to prevent the spread of such disease.

SEC. 25. Every physician or midwife attending or present at the birth of any human being within the - - shall, within twenty-four hours thereafter, certify the same to the health officer‡ upon blanks prescribed by the State Board of Health to be furnished by said health officer. In case there be no attending physician or midwife, then the next of kin or other person present at such birth shall, within twenty-four hours thereafter, report the same to the health officer, who shall then have the proper blank filled out.

SEC. 26. All physicians, midwives and undertakers practicing or doing business in this ---- ----- shall register their names and addresses with the Secretary of the Board of Health¶ within thirty days after the promulgation of this ordinance; and hereafter within ten days after beginning practice or business.

SEC. 27. Such pertinent portions of chapter 214, Laws of 1893, as are not included in the above sections are hereby adopted as a part of this ordinance.

SEC. 28. Every person violating any section of this ordinance shall be liable for every such offense, upon conviction before the mayor or other

*City or town.

†If preferred the vaccination of paupers might be required of the health officer, where there is one, the town furnishing the virus, or the fee might be fixed in advance by agreement with the physicians. The vaccination of the people is of the highest importance and every effort should be made to accomplish it. The amount of raw material ready to be worked up by small-pox in this State is simply appalling.

‡Where there is no health officer substitute "City or Town Clerk."

¶Where there is no Board of Health substitute "City or Town Clerk."

justice of the peace, to a fine of not less than $3 nor more than $25, or imprisonment for not more than ten days, at the discretion of the convicting justice, besides costs, which he may inflict in addition if he see fit.

BIRTH CERTIFICATE.

_____ N. C., _____ 189__

Date of Birth _____

Name of Child, if named _____

Name of Father _____

Name of Mother _____

Residence, No. _____ Street _____ Ward

Color _____ Sex _____

Condition of Child _____

_____

Attending Physician or Midwife _____

CERTIFICATE OF DEATH AND APPLICATION FOR BURIAL OR TRANSIT PERMIT.

To the* _____ of _____ N. C.:

Date of Death _____

Full Name of Deceased† _____

Sex, Male or Female _____

Age _____ Years _____ Months _____ Days.

Color _____

Married, Single, Widow or Widower _____

Occupation _____

Birthplace _____

Place of Death, No. _____ Street, _____ Ward.

Cause of Death _____

Duration of Last Sickness _____

Place of Burial
Date of Burial } _____ M. D.,
Undertaker
Place of Business } ‡ *Medical Attendant.*

Personally appeared before me on this the _____ day of _____ 189__

_____ and made oath that the above statement in regard to the death of _____ is true.

_____, J. P.

*This certificate must be returned to the official selected for the purpose—Town Clerk, Chief of Police or some other—for Burial Permit.

†If still-born, give names of parents on this line.

‡In case there was no medical attendant, this certificate may be signed by the Health Officer, after careful inquiry as to the facts required to be noted. Or it may be signed on oath before a Justice of the Peace by the householder in whose house the death occurred, or by the next friend of the deceased who was present. Where there was an attending physician no other signature than his should be accepted.

NOTE.—The apparent amount of "red tape" in this certificate in the matter of requiring the householder or next friend to make oath before a Justice of the Peace is rendered necessary by the fact that death certificates are often used in the courts as evidence, and the disposition of large sums of money may depend upon their accuracy and reliability.

No. .....

Date ..... 189..

Name .....

Age ..... Sex ..... Color .....

Date of Death .....

Cause of Death .....

Place of Death .....

Date of Burial .....

Place of Burial or Destination .....

.....

Undertaker .....

Place of Business .....

The Superintendent or other person in charge of the cemetery designated in this permit shall sign and return the same to this office on or before the Saturday following its issue.

Respectfully returned,

.....

Supt. ..... Cemetery.

No. .....

BURIAL PERMIT.

This permit must in all cases accompany the body to its destination.

..... Department.

..... N. C., ... 189..

Permission is Hereby Given to remove the remains of .....

Date of Death ..... 189.. ; age .. yrs. .. mos. .. days.

Place of Death .....

Cause of Death .....

Date of Burial .....

Place of Burial or Destination .....Color .....

To .....Cemetery for Interment.

To .....Company for Transportation.

Undertaker .....

Place of Business .....(The Designated Officer).....

FORM FOR SANITARY INSPECTION OF CITIES AND TOWNS.

1. Inspection-books are furnished as per Form No. 1.

2. The Inspector is presumed to have received intelligent drilling from the Health Officer in the many features of unsanitariness which will be met with, and is moreover, presumed to be a person of good judgment and discretion, and to have a high standard of sanitary methods, with his heart in the work.

3. The inspection districts having been designated by the Board, the Inspector begins work at a set point and makes an entire inspection of the district house by house, block by block, noting down the conditions in Inspection-book as provided under manner of Form No. 2.

4. Should any bad features exist the Inspector is to point out to the householder where the remedy can be applied and the necessity for it, and to leave upon the premises the notice of Form No. 3. Should the existing conditions be not really bad, but clearly not good, the Inspector is required to inform the householder where the defect lies, and to urge upon him the benefits resulting from thorough cleanliness.

5. After each inspection district has been gone over Inspector should make a report to the Health Officer or Mayor of total inspections and their results upon Form No. 4: this to be kept on file by the Secretary of Board for future comparisons.

6. A space of nine lines should be given to each lot in order that the record of the whole number of inspections made during the year (monthly from April to October, inclusive, and quarterly thereafter) may be arranged for easy comparison. The Inspector should not only call attention to violations of the sanitary rules and regulations and note bad conditions, but he should make it a point to encourage those who are evidently trying to do their sanitary duty.

7. At stated intervals a notice should be given through the public press of what the comparative results show, thereby enlisting an interest in the work from those who might not be reached by other means.

Although modified by myself in some respects, the credit for these forms is due to Mr. Alfred V. Wood, Secretary of the Board of Health of Brunswick, Ga., a brother of our late deeply lamented Secretary, and a sanitary expert.

FORM NO. 1.

SAMPLE PAGE OF INSPECTION BOOK.

1893-'94.					1	2	3	4	5	6	7	REMARKS.
April	1	124	Wolf	Street,	b	a	a	b	c	a	a	1. Too much litter and trash. 5. Very foul.
May	3	"	"		a	a	a	a	b	a	a	5. Improved, but not clean yet.
June	2	"	"		a	a	a	a	a	a	a	
July	2	"	"		b	a	a	a	b	a	a	1. Rank weeds. 5. Not enough dry earth used.
Aug.	1	"	"		a	a	a	a	a	a	a	
Sept.	2	"	"		b	a	a	a	a	a	a	
Oct.	1	"	"		a	a	a	a	a	a	a	
Jan.	3	"	"		a	a	a	a	a	a	a	
April	1	T.	H.	Jones,	c		c		x		b	1 & 3. Dirty pig-pen too near well. 5. Very foul, never cleaned.
May	3	"	"		b		b		a		b	1. Pig-pen improved, floor raised, so that can be raked under.
June	2	"	"		a		a		a		b	

And so on down.

NOTE.—By allowing nine lines to each lot there will be a line for each one of the inspections required by the ordinance—monthly from April to October, inclusive, after. "124 Wolf Street" represents a complete establishment, "T. H. Jones" an humbler one with no stable or other out-building and no sink.

The inspector should carry this book with him when making his rounds and make his notes on the spot.

FORM NO. 2.

(To be printed or written on first fly-leaf of Inspection Book).

Column No. 1 indicates condition of Premises [other than below].

"	" 2	"	"	Stable.
"	" 3	"	"	Well or Pump.
"	" 4	"	"	Sink.
"	" 5	"	"	Privy.
"	" 6	"	"	Out-building.
"	" 7	"	"	Residence.

A indicates Good. B indicates Fair. C indicates Bad. X indicates a serious menace to health.

FORM NO. 3.

SANITARY INSPECTION DISTRICT No._____

_____ 189__

Mr._____

No._____, _____ Street.

Your premises are found to be in a very unsanitary condition, so much so that it endangers the public health. You will take notice that you will be reported to the*_____ unless this condition is bettered before my next visit.

_____ Inspector.

*Health Officer or Mayor.

☞ To be sent on the first day of each month for the month preceding to the Health Officer or Mayor.

FORM No. 4.

SANITARY INSPECTION DISTRICT No. ....

Month of ..... 189..

No. Inspections Made.	No. Fair Condition.	No. Bad Condition.	No. Requiring Immediate Attention.

Remarks: .....

..... Inspector.

DISCUSSION.

Dr. Thomas stated for the information of those living in the eastern part of the State that the Quarantine Station to be built at Southport was intended to be a relief station for all that part of the State, so that if any vessel came to any port where the port officer felt he did not have the provisions for properly caring for her she could be sent to the station at Southport. As a representative of the Quarantine Board he felt especially under obligations to the State Board of Health. To accomplish this work has been a thing long hoped for. Many visits have been made to the Legislature in their efforts to gain the assistance of the State. Practically all the stations south of us are provided with stations of approved pattern. They believe that only superheated steam is a safe disinfectant for the baggage and clothing of passengers and crews of infected ships, and such an apparatus will be erected at the Cape Fear Station. Notwithstanding the cavils of the laboratory men sulphur will still be used for disinfecting the holds of vessels. It has been so effective thus far that no vessel which has been disinfected with sulphur and washed with bichloride solution has been

known to carry contagion. He invited members of the Society to visit the Station after its completion and see it in operation.

Dr. Reagan deprecated the lack of interest on the part of members in the Conjoint Session, and thought this lethargy must be overcome before we can expect to excite the interest of the legislators and the laity.

Dr. H. W. Lewis said it would take the stimulus of an epidemic to create an interest in sanitary matters among the physicians of his county. In making his reports as Superintendent of Health he had to depend almost entirely upon his own practice in enumerating the prevailing diseases. He thought the law, while probably as good as could be obtained, was defective in not making provision for the remuneration of Superintendents for their extra and especial services in case of epidemics. He understood the law to only give the Superintendent the right to charge for his visits to the poor-house and jail. (The Secretary explained that it gave him the right to demand the fees usual in his county for any services he might render). He regretted there had been no legislation in regard to vaccination. His county was raising a large crop for the Reaper should an epidemic of small-pox appear.

The Secretary stated that in regard to vaccination the Conference were in accord as to the desirability of compulsory vaccination, but that such a clause in the bill would have jeopardized the whole bill. People cannot be driven in these matters. In this connection he referred to some remarks made by Dr. Lewis at the last meeting, when he stated that he had appointed a day on which to vaccinate the pupils at a county school, and when he arrived there he found that all the school had taken flight.

The Secretary announced that the terms of office of himself and Dr. Bahnson expired with this meeting, and that

under the new law these vacancies would be filled by the Governor's appointment.

There was some discussion as to whether it would be proper for the Society to recommend candidates for appointment, but it was the sense of the meeting that it should be left for the Governor to ask for such recommendation should he desire it.

The Secretary called the attention of Superintendents of Health to the fact that it is now made obligatory on him to notify the County Commissioners of the failure on the part of the Superintendents to make their reports. He also urged upon physicians to attend the meetings of the Board of Health for the election of Superintendents that proper men may be selected for these positions.

On motion the Conjoint Session adjourned.

RICH'D H. LEWIS, M. D.,
Secretary.

CONJOINT SESSION AT GREENSBORO, MAY 15, 1894.

At 12 M. the Board met in conjoint session with the State Medical Society, President Bahnson in the chair.

Passed Assistant Surgeon Jos. J. Kinyoun, of the United States Marine Hospital Service, having accepted an invitation of the President of the Board to attend the meeting, was upon motion invited to a seat upon the floor and to participate in the discussions. He acknowledged the courtesy in an appropriate manner.

The Secretary then read his annual report as follows:

ANNUAL REPORT OF THE SECRETARY OF THE NORTH CAROLINA BOARD OF HEALTH.

By Richard H. Lewis, M. D., Raleigh, N. C.

When your Secretary made his last annual report the sanitary sky to the eastward was overcast with the dark and lurid clouds of cholera. There was in the minds of people at large to some extent, but more especially of those whose duty it was to stand as sentries upon the watch-towers, a feeling of apprehension lest these threatening clouds should reach our shores and deluge us with the dreaded pestilence.

Later yellow fever appeared at Brunswick, Ga., almost at our doors, and our health officers on our seaboard, particularly at our port of Wilmington, had their anxieties greatly increased. Still later small-pox began to spread over the country and is not yet, we regret to admit, stamped out.

Notwithstanding these valid grounds for uneasiness our fears have not been realized. We have to felicitate ourselves and the people of our State and generally of our whole country upon their escape. And in doing so we should make our acknowledgments to the United States Marine Hospital Service for its excellent management in keeping cholera (except one case at Jersey City) out of our country and in practically bottling up the yellow fever at and near Brunswick.

In making this report your Secretary does not consider it necessary to read all the *data* bearing upon what has been done, but will be more general in his method and refer those interested to the archives of the Board where they can be found and consulted.

On June 20th a circular-letter was sent to the Mayors of all county-seats and all other towns and cities of 500 or more inhabitants, reminding them of the sanitary suggestions previously made to them and referred to in my last report, enclosing copies of a model health ordinance, death certificate, burial permit, birth certificate and other sanitary blanks, and begging them to make necessary provision for the protection of the lives and health of their people and for securing more reliable vital statistics.

An editorial on this subject, giving this letter and also another addressed to the physicians residing in the above noted towns and cities urging them to interest themselves in this matter and do all in their power to induce the municipal authorities to take action—chiefly by organizing local Boards of Health—was published in the June Bulletin. While the result was not at all flattering some of the seed fell on good ground. Salisbury and Oxford adopted the model ordinance—exactly as recommended—and other towns, we have reason to believe, were induced by it to improve their methods—particularly this goodly town of Greensboro.

The following will show in detail what was done:

On July 9th I received a letter from Dr. Leinster Duffy, Superintendent of Health of Craven county, informing me that an epidemic of typhoid fever of an extremely malignant type was prevailing in the neighborhood of Core Creek and asking if any arrangement existed for the special investigation of such cases. His letter was promptly referred to the President of the Board, who appointed Dr. W. H. Harrell, a member of the Board, to visit Core Creek and investigate the matter. Dr. Harrell responded and made the following report:

Dr. Richard H. Lewis, Secretary of the North Carolina State Board of Health, Raleigh, N. C.

DEAR SIR:—By order of the President I visited Core Creek, Craven county, as the representative of the State Board of Health, and make the following as my report: In company with Dr. Leinster Duffy, County Superintendent of Health for Craven county, I examined the premises of a number of householders where typhoid fever existed in an epidemic form. There have been 36 cases and 13 deaths out of a population of about 150. I found that no regard whatever had been paid to sanitation, notwithstanding the repeated warnings and instructions from the attending physicians. Discharges from the bowels had been emptied in the yards near the wells: whole families had used the same drinking utensils that the patient used, and no effort had been made to clean the yards, protect the water supply or to isolate the patient. Patient, family and visitors drank out of the same dipper, soiled clothes were allowed to stay in the room for a considerable time and then be washed at the well. Carelessness and negligence of the grossest and most reprehensible form has produced in a small village a severe and fatal epidemic. I suggested that the wells be not used at all; that driven pumps be substituted; that the drinking water be filtered or boiled, or both; that the premises be thoroughly cleaned, limed and drained; that all bedding be aired and disinfected, and that all intestinal discharges be sterilized and buried deeply at a distance from all wells and houses. I am indebted to Drs. Duffy and Whitaker, of Trenton, for assistance in the investigation, and for their personal attendance. There can be no blame attached to the attending physicians in the matter, as they had repeatedly insisted that all the above suggestions be carried out. They did not have the co-operation of the people, therefore could do nothing. I was assured by the best people of the community that all means suggested above would be used to stop the spread of the disease so far as it was in their power.

Yours, etc.,

W. H. HARRELL.

In consequence of this severe epidemic at Core Creek and the rather wide-spread prevalence of the disease it was thought well to call attention in the July Bulletin to the great importance of every physician's carrying out or seeing carried out the recommendations made in section 21 of the law in regard to the disinfection of the *dejecta* of typhoid fever before being emptied.

On July 14th a telegram was received from Surgeon General Wyman, M. H. S., asking for the facts in regard

to the report of cholera in Northampton county that had appeared in the letter of a newspaper correspondent. During the day similar inquiries were made of the Secretary by parties as far distant as Ohio.

Having heard nothing from Dr. H. W. Lewis, the Superintendent of Health of Northampton county, I felt satisfied that the report was a mere rumor. But to settle the matter I immediately wired Dr. Lewis for the truth. I received the following reply:

> No cholera or disease resembling it here. I reported some dysentery in the county, and a few have died in Rich Square and Gaston townships. I have not seen a fatal case in this community.
>
> H. W. LEWIS.

A letter from Mayor Ellis, of Newbern, asking my opinion and the views of the Board of Health in regard to privy sinks, was received July 1st. A reply was sent expressing the opinion that, looked at from a sanitary point of view, they were utter abominations and should be condemned and abated at the earliest possible moment.

On July 15th a communication was received from Dr. Julian M. Baker, of Tarboro, announcing the sudden appearance in the town of eight or ten cases of typhoid fever without any manifest cause and requesting that a member of the State Board of Health be sent there to investigate the matter. In accordance therewith, Dr. Hodges not being able to go on account of sickness in his family, the writer was sent by the President.

Upon arrival at Tarboro a conference was held with the Mayor and the local profession. A statement of the facts and an expression of opinion was asked of each one. The facts were that twenty-seven cases had occurred up to that time, the first about a month before. That in some instances the fever was not typical. That it was not particularly malignant, although five had died. That the drinking

water was obtained from ordinary wells as a rule, while those using cistern water did not restrict themselves to that. That the main street of the town was sprinkled with water pumped into mains from Hendrix creek, and that the same was used by some drug stores for washing soda-water glasses, etc. That a case of typhoid fever had occurred on the watershed of said creek during the preceding winter. That in nearly every instance typhoid fever had occurred on the same lot within a few years previous and that the undisinfected dejections had been thrown out upon the surface of the ground or emptied into the ordinary privy—which is the same thing. That about the time of the beginning of the epidemic the water in the wells was rather low from drought.

Samples of the water from Hendrix creek and from the two wells most in evidence were sent to the State Experiment Station for chemical analysis, and, Surgeon General Wyman, of the Marine Hospital Service, having at my request promised to have bacteriological tests made, to Washington also. Unfortunately the threatenings of cholera at the port of New York and the yellow fever at Brunswick so occupied the department, taking the bacteriologist of the service, Dr. Kinyoun, out of his laboratory, among other things, that the latter examinations could not be made. The water, however, was promptly analyzed chemically, and while the water from the creek, which no one drank, proved to be objectionable, that from the wells was better and fairly good drinking water. So that no manifest explanation of the prevalence of the fever could be obtained. The theory most plausible to my mind, after carefully considering the facts, was that the town was suffering the consequences of former sanitary sins—that the undisinfected discharges of former cases had poisoned the soil; that certain subtle conditions favorable to the development of the germs

of the disease were apparently present, judging from its unusual prevalence in very numerous localities; that the bacilli had reached the wells and being relatively more abundant on account of the low water had produced their legitimate results.

In the way of recommendations it was suggested that the wells should all be thoroughly cleaned out and that the water drank should be first boiled. Also that the town should be thoroughly cleaned. And finally the attention of the physicians was called to section 21 of the act relating to the Board of Health, requiring the disinfection of all typhoid fever *dejecta* before being emptied, and the importance of its observance emphasized and illustrated by the prevailing condition of affairs. I was informed by Dr. Williams, the Superintendent of Health, that the suggestions made were carried out and that no more new cases occurred—whether *post hoc* or *propter hoc* we will not say.

COUNTY BOARDS OF HEALTH.

One of the wisest provisions of our new law is that requiring the Secretary of the State Board to notify by mail all persons eligible to membership in the County Boards of Health, of the time and place of meeting for the election of County Superintendent. In the Act of 1885 no provision was made for calling these meetings, and it being the business of no one in particular, it was frequently not done. In consequence the meetings in the counties that had organized auxiliary Boards were irregular as to time and sparsely attended as to members, while in counties having no Boards it was very difficult to start them. In performance of the duty laid on me by section 8 I sent notices to all those eligible to membership, both medical and lay, in the sixty-seven counties having Boards of Health and to those in the twenty-nine counties having no Boards,

respectively. In the notice to physicians I thought it best not to confine myself to a bare notification of time and place, but to take advantage of the opportunity afforded to urge upon them the importance in the one case of attending the meeting of their County Board and in the other of assembling and organizing a Board in order that they might exercise the privilege conferred upon them by the State of selecting their health officer.

The result was very gratifying. The attendance in the counties already having Boards was in nearly every instance much larger and more interest was shown than ever before. In the other counties sixteen new Boards were organized and Superintendents of Health elected, making the total number of Superintendents eighty-three, as against sixty-seven before. Although much encouraged your Secretary was not satisfied, and so sent on September 20th a letter to the Chairman of the Board of Commissioners of each county that had failed to comply with the law urging them to elect a Superintendent of Health.

As a result of this five more Superintendents were elected by the Boards of Commissioners, leaving still seven counties with no legal health officer. A third letter was sent to each of these Boards and as a result two more Superintendents were elected, so that at present we have a total of 91 counties out of 96 with an official representing the sanitary interests of the people. The counties still unprovided for in this respect are Camden, Currituck, Hyde, Pamlico and Washington. It is earnestly hoped that ere another year rolls around they will take their proper place in the health procession.

YELLOW FEVER.

In the *Wilmington Messenger* of September 6th there appeared a communication signed J. H. Sykes, dated September 5th, stating that he had been informed by a

gentleman from French's Creek, Bladen county, that a woman coming from Brunswick, Ga., between two and three weeks previously had just died, after an illness of forty-eight hours, of what was pronounced by Dr. Lucas, of our Board, the attending physician, yellow fever. On the same day telegrams were received from Mr. Harris, Acting Mayor of Wilmington, asking for information, and from Dr. Thomas, of our Board, giving the substance of the communication and asking if he should investigate the matter. In view of his proximity to Bladen county and the difficulty of reaching Dr. Lucas by wire he was requested to do so. With characteristic promptness and energy he managed the investigation and the next day received a statement from Dr. Lucas to the effect that the person referred to "did not die of yellow fever." After a sickness of nearly two weeks "she died with typho-malarial fever. * * * It is currently reported that she had yellow fever, but it is false." So the threatened panic was at once nipped in the bud.

On September 24th I received a letter from Supervising Surgeon General Wyman, of the Marine Hospital Service, enclosing "a newspaper clipping relative to an alleged occurrence of yellow fever aboard a vessel from Wilmington, N. C." The letter was referred to Dr. Geo. G. Thomas, Secretary Quarantine Board, Port of Wilmington, as well as a member of our State Board of Health, for answer. From his reply now on file in the Secretary's office it appears that the disease alluded to was evidently malarial.

On the same day a written request was received from Dr. J. W. McGee, Physician to the Pentitentiary, requesting me to officially visit the Penitentiary and aid the authorities in investigating the cause of an outbreak of fever, malarial and typhoid, made up of 41 and 21 cases respectively, inside the prison. A careful investigation

explained satisfactorily the malarial fever as due to digging from a bottom and working in clay for making bricks, but the cause of the typhoid was not satisfactorily arrived at. All but five of the typhoid cases worked in the same bottom and drank from a spring and may have been poisoned there. The first inquiry was of course as to the prison drinking water, but there was not the slightest superficial evidence of its possible contamination and it was not feasible to have a bacteriological examination made at the time. It could hardly have been that, for the reason that all the prisoners were served with exactly the same water, and while most of the fever cases had been at work outside, there were five who had not gone beyond the walls, four of which five worked in the machine shop. There were no unsanitary conditions about this shop and we had to give it up. There were two deaths.

In compliance with the duty imposed upon the Secretary in section 16 of the Health Law in connection with the transportation of the bodies of persons who had died from contagious diseases enumerated in section 9 of the same act, I prepared and distributed to all of the common carriers in the State, according to a list kindly furnished by the State Railroad Commission, the following circular:

DIRECTIONS FOR DISINFECTING AND ENCASING DEAD BODIES.

Laws of 1893, Chapter 214, Section 16.

"No railroad corporation or other common carrier or person shall convey or cause to be conveyed through or from any city, town or county in this State the remains of any person who has died of small-pox, measles, scarlet fever, diphtheria, typhus fever, yellow fever, or cholera, until such body has been disinfected and encased in such manner as shall be directed by the State Board of Health, so as to preclude any danger of communicating the disease to others by its transportation; and no local registrar, clerk or health officer, or any other person, shall give a permit for the removal of such body until he has received from the Board of Health of the city, or from the Board of Aldermen or Town Commis-

sioners, or the County Superintendent, of the city, town or county where the death occurred, a certificate stating the cause of death and that the said body has been prepared in the manner set forth in this section; which certificate shall be delivered in duplicate to the agent or person who receives the body, and one copy shall be pasted on the box containing the corpse; said certificate shall be furnished in blank by the transportation company when no local Board of Health exists." * * *

DIRECTIONS.

The body of a person dying of either of the diseases enumerated above must, before acceptance for transportation by any railroad corporation or other common carrier in this State, be enveloped, so completely as not to leave any portion of the body whatever exposed, in a sheet thoroughly saturated (dripping wet) with a solution of bichloride of mercury of not less strength than one ounce of the mercury to one gallon of water. And it shall likewise be encased in an air-tight metallic or metal-lined casket, hermetically sealed and enclosed in a tight wooden box of good strong stuff free from knots and cracks, of not less than one inch in thickness.

The death certificate and transportation permit required by section 16, above quoted, shall have printed thereon these directions and the affirmation duly signed by the proper official that they have been carried out.

RICH'D H. LEWIS,
Secretary.

The railroads seemed to approve the regulation. Col. W. A. Turk, G. P. A., R. & D. R. R., sent copies of the forms he was having prepared for any correction that they might be sure to conform to the law.

On November 1st I received a letter from Dr. R. L. Payne, Jr., Superintendent of Health of Davidson county, asking "the usual interpretation of certain points," those points being: 1. Should the Superintendent be paid for his services in quarantining and disinfecting by the householder or by the public authorities? 2. If the latter, the patient being in a municipal corporation, whether by the said municipality or by the county? I replied to the effect that the expense of quarantine and disinfection laid upon the householder by the law did not mean the pay of the health officer, and that unless the municipality for its better

protection had created its own special Board of Health with its own health officer to perform for itself the duties of the County Superintendent it was clearly the duty of the county. Submitting Dr. Payne's letter and my reply to Attorney General Osborne, he gave me the following opinion:

RALEIGH, N. C., November 11, 1894.

Dr. R. H. Lewis, Secretary North Carolina Board of Health, Raleigh,

DEAR SIR:—In reply to your question concerning the payment for the services of the County Superintendents of Health I take great pleasure in stating that I agree with you entirely in your construction of the statutes on that subject passed by the last Legislature. I understand your opinion to be that the county, and county alone, pays for the services of the County Superintendent of Health, and not the householder nor the town, when the services are performed in a town. As I stated before, I agree with you, and the construction seems to me too clear for debate. Yours respectfully,

F. I. OSBORNE,
Attorney General.

The County Commissioners, after reading this opinion, said it was not worth any more than the opinion of any other lawyer, and that they would rely upon that of their own attorney, which was that the Superintendent should be paid by the householder. Dr. Payne, however, took a firm stand, declining to make any agreement with them as to definite salary and proposing by charging full fees for the regular duties of County Physician and for services in the matter of quarantine and disinfection to paupers to obtain a fair remuneration for his work, in consequence of which the Commissioners agreed to pay him a reasonable salary.

Dr. J. A. Hodges, owing to removal from the State, resigned from the Board, thereby depriving us of an active and interested member. After consultation with the President it was thought best, in order to avoid the expense of a special meeting for the purpose, to have the members signify

their choice of his successor by letter to the Secretary. That course was taken and Dr. John Whitehead, of Salisbury, was unanimously elected to fill the vacancy. The letters are on file in the office of the Board.

Dr. J. T. Smith, Superintendent of Health of Perquimans county, one of the leading physicians of his county and a worthy Christian gentleman, passed away in October, having been stricken with fatal illness very soon after his election on the first Monday in September. After waiting a reasonable time and hearing nothing of the election or appointment of any one to fill the vacancy, I addressed a circular-letter to the physicians of the county and a similar notice to the non-professional members of the County Board, notifying them to attend a meeting for the election of a successor to Dr. Smith.

On the 6th of December I received a very courteous letter from Mr. J. H. Blount, of Hertford, the able Solicitor of the First District, stating that at the meeting called as above Dr. J. W. Speight was elected. That the Board of County Commissioners had previously elected Dr. McMullan. That a majority of those eligible to membership in the County Board was not present at this meeting nor at that which elected Dr. Smith in the first instance. That he wished to settle the contest between the two gentlemen named. He presented these three questions: "1. If a Superintendent is elected and there is a vacancy what provision or authority is there to fill the vacancy? 2. What provision or authority is there to call a meeting of County Boards of Health on any other day than that designated by the act? 3. What power or authority has less than a majority of the County Board of Health to elect a Superintendent?" and asked that the Attorney General be requested to pass upon them.

The following is an abstract of my reply: No provision for filling vacancies was made in the law. In the absence of

special instructions common sense would suggest that the same power which originally filled the office should fill any vacancy occurring in it. According to my information Dr. J. T. Smith had been properly and regularly elected according to law Superintendent of Health of Perquimans county on the first Monday in September. In obedience to the duty laid upon me as Secretary of the State Board of Health, in section 8 of the law, I had notified all persons eligible to membership in the County Board of Health of the meeting to be held on the first Monday in September. It having been made my duty in that case and not made the duty of any one else in the other, it was reasonable to suppose that it was my duty to arrange for the second meeting. In answer to his third question I stated that I could not give an opinion other than that it had been customary for the County Boards to act regardless of the number present and no point had ever been raised except in one instance. Upon the return to the city of the Attorney General I submitted to him the letters from Mr. Blount, Mr. Speight, the Register of Deeds, Dr. J. W. Speight, the newly elected Superintendent, and my reply to the first named, and asked his opinion. He gave it as follows:

RALEIGH, N. C., December 18, 1893.

Dr. R. H. Lewis, Secretary of the State Board of Health:

After carefully reading the letter of Mr. J. H. Blount to you of December 6, 1893, concerning the election of a County Superintendent of Health for Perquimans county, I find that it is necessary for a proper decision upon the subject to answer only the third question therein propounded. That question is, What power or authority has less than a majority of the County Board of Health to elect a Superintendent? Less than a majority of the County Board of Health has no power or authority to elect a Superintendent. Without giving my reason for this conclusion more elaborately, I refer you to the case of the Cleveland Cotton Mills *vs.* The Commissioners of Cleveland County, 108 N. C. Reports, page 678, which to my mind is conclusive of the question. If I am right, the office of Superintendent above referred to was never filled by the Board of Health, as there was no legal meeting at the time authorized by law, as

a majority did not meet. If there was no lawful meeting there was no legal election. When the County Board fails to meet, as authorized by law, the Board of Commissioners must elect a Superintendent. A majority of the Board of Health of Perquimans county did not meet, so the letter states, and did not elect Dr. J. T. Smith to the office of Superintendent, therefore that office has never been legally filled. It is vacant now and must be filled in accordance with section 5, chapter 214, Laws of 1893. The County Commissioners must therefore, if they have not already done so, elect the Superintendent.

With reference to the other questions in the letter, permit me to say that I will answer them at any time they may become practical, or whenever you deem it necessary for me to do so.

Yours respectfully,

F. I. OSBORNE,
Attorney General.

In accordance with this opinion the County Commissioners elected Dr. J. W. Speight, the present incumbent, the same gentleman that had been chosen by the County Board of Health.

In view of this decision of the Attorney General it is of great importance that the physicians of the State should not forget when the time for the next meeting to elect a Superintendent arrives on the first Monday in September, 1895, that a majority must be present to make a legal quorum.

WATER AND WATER SUPPLIES.

During the year a number of analyses of water under permit of the Board have been kindly made for us by the State Experiment Station, Dr. H. B. Battle, Director. Without mentioning those devoid of special interest I will call attention to those of the two extremes. A sample from the deep well system recently put in at the State Hospital at Morganton showed a water of singular purity. In the words of the chemist, "it is refreshing to see such an analysis." On the other hand, samples last fall from the Little river water supply of Goldsboro showed an alarming

amount of albuminoid ammonia. As a result of the correspondence which ensued between Mr. T. H. Bain, Clerk of the City Board of Health, and myself the State Board was requested to send a committee to investigate the water supply. In compliance with this request President Bahnson designated Dr. Geo. G. Thomas and myself. After an inspection of the works and water-shed for a mile and a half above the intake, various inquiries and consultation, we prepared and transmitted a full report, as follows:

RALEIGH, N. C., May 3, 1894.

T. H. Bain, Esq., Secretary City Board of Health, Goldsboro, N. C.,

DEAR SIR:—The undersigned, constituting the Committee of the State Board of Health appointed by its President at the request of your Board to inspect the public water supply of your city and make recommendations or suggestions in regard to the same, beg leave to report through you as follows:

An inspection of the water-shed of Little river, extending not more than a mile and a half above the pumping station, revealed several sources of contamination:

1. A large ditch draining the land west of that portion of the town near the depot of the North Carolina Railroad, the rice mill, and all the land between these localities and the river. On the slope midway between the rice mill and the river we noted a number of small houses occupied by negroes. The yards were dirty, there were hog-pens on several, and as no privies were in evidence we assume that the human excrement, in common with all other kinds of filth, is deposited upon the surface of the ground to be washed by the first rain into the ditch towards which all these lots slope.

2. About three hundred yards north and east of the point at which the ditch crosses the county road going towards Hook's bridge another stream runs across the road and empties into the river an eighth of a mile above the pumping station. This stream rises in or near a small hamlet called "Greenleaf" and drains all the open land between this settlement and the river. The man in charge of the station informed us that during heavy rains this stream was laden with filthy matter.

3. One mile and a half above the pump-house there empties into the river a moderately large branch which supplies water for a whiskey distillery and flows through the large hog-pen attached to the establishment. About one hundred hogs are penned and fed, on both sides of this stream and in large open boxes over it, upon the refuse of the distillery. Their

droppings mixed with this fermenting matter are washed into the stream and down into the river. The distillery is from a half to three quarters of a mile from the river and this space is a range for hogs.

4. A small settlement of negroes on Mr. Howell's plantation beyond the river, the drainage from the same being into that stream.

5. A grave-yard, still in use, about twenty feet from the river bank.

6. The arable land adjacent, the principal fertilizing material used being composted manure.

Analyses of the Water.—The three samples taken from the river in November, when there was a slight freshet, at the mouth of the intake and from two points in the course of the mains and numbered "1," "2" and "3," show respectively: free ammonia .152, albuminoid ammonia .30 parts per million; free ammonia .048, albuminoid ammonia .254, and free ammonia .066 and albuminoid ammonia .256.

Of the four samples sent to the Experiment Station in March "No. 1, taken from the river about one and one-half miles from pumping station," shows: chlorine 19.10 grains per gallon, free ammonia 0.592 parts per million, albuminoid ammonia 0.578; "No. 2, an inlet about one mile from pumping station," shows: chlorine 5.40, free ammonia .150, albuminoid ammonia .188; "No. 3, fifty feet from pumping station," shows: chlorine 0.58, free ammonia .064, albuminoid ammonia .106; "No. 4, from intake at pumping station," shows: chlorine 1.00, free ammonia .080, albuminoid ammonia .116.

Mr. Wanklyn, one of the highest authorities on water analysis, lays down the following rules: "If a water yield .00 parts of albuminoid ammonia per million it may be passed as organically pure, despite of much free ammonia and chlorides; and if, indeed, the albuminoid ammonia amounts to .02 or to less than .05 parts per million the water belongs to the class of very pure water. When the albuminoid ammonia amounts to .05 then the proportion of free ammonia becomes an element in the calculation; and I should be inclined to regard with some suspicion a water yielding a considerable quantity of free ammonia along with .05 parts of albuminoid ammonia per million. Free ammonia, however, being absent or very small, a water should not be condemned unless the albuminoid ammonia reaches something like .10 per million. Albuminoid ammonia above .10 per million begins to be a very suspicious sign; and over .15 ought to condemn a water absolutely." In making a practical application of these rules it should be borne in mind, as Wilson in his Hand-book of Hygiene, from which the above is taken says, that surface waters in country districts may have more than .15 albuminoid ammonia and yet be comparatively innocuous for the reason that it may be of vegetable instead of animal origin, and especially is this apt to be the case if the amount of chlorine is exceedingly small.

Having now before us the facts to be judged and the rule by which to judge them, we draw the following conclusions:

1. If the three samples analyzed in November, 1893, are fairly representative of the water it should in our opinion be condemned for drinking purposes. Although from the small amount of chlorine yielded by those samples it is more than probable that the chief source of the albuminoid ammonia was vegetable matter the amount is entirely too large, no matter what its origin.

2. Of the samples drawn in March, No. 3, taken fifty feet from pumping station, and No. 4, from intake, represent indifferent to fair drinking water chemically considered. No. 2, from a small stream running along by the county road and emptying into the river, is bad, while No. 1, from the river near the mouth of the stream running through the large hog-pen of the distillery, is extremely bad—simply villainous. This hog-pen is manifestly the chief source of impurity.

3. We desire to call particular attention to the fact that chemically impure water while bad is not the worst—that water which, according to the chemical analysis, is good, potable water may yet be deadly if contaminated by the specific germs of disease, although still worse if both chemically and biologically impure. To make a practical application of what we mean we will say by way of illustration that if a case of typhoid fever should occur in one of the houses on the ditch between the rice mill and the river and if the undisinfected dejections of the patient should be thrown into the ditch or on the surface of the ground sloping towards it, the danger to the persons drinking the river water would be much greater than the hog-pen alone could make it.

RECOMMENDATIONS.

1. That if your Board does not already possess it you make it a point to obtain from the next General Assembly a special act giving you full control of the water-shed of Little river in its relations to the purity of the water of that stream.

2. That the stream known as "Jumping Run" be drained into the large ditch which now empties immediately above the pumping station, and that a canal be dug behind the station so as to convey all the water from "Jumping Run" and the ditch nearer the town, which receive the washings of the negro settlement alluded to, into the river at a point not less than one hundred (100) feet below the point of intake.

3. That you make it your business to see that section 21 of Chapter 214, Laws of 1893, which bears on this subject, is rigidly enforced.

4. That immediate steps be taken to abate the very offensive nuisance of the hog-pen as now located at the distillery.

5. That all persons living on the water-shed who come within your jurisdiction be required to construct privies and use in the same the tub and dry earth system.

6. That the water company be urged to purify the water as much as possible. A properly constructed and properly cared for sand and gravel filter would probably afford the best means of accomplishing it as things now stand. But there is a more excellent way, and that would be to abandon the river altogether and obtain the water for the town from deep wells bored through the stratum of impervious marl or clay which underlies your section. We were told that such a well furnishing excellent water had at one time existed in your city. The very best filters are not always reliable, and they are very expensive to make properly. Inferior filters are positively worse than nothing, actually increasing the danger. Granting that you had dictatorial powers and the greatest abundance of money, it would be practically impossible for you to effectually guard from contamination such an area as is drained by Little river. Granting that the water company would construct the very best filters and operate them in the very best manner, you could never feel entirely safe during the prevalence of cholera or typhoid fever (a very common disease, killing, it is estimated, more than a thousand of our people every year) up the river. Water from the deep wells referred to could not be contaminated. It would possess the confidence of your citizens. It would in all probability be clear and attractive in appearance. The imagination could not conjure up any horrible possibilities as to what it might contain. The people would drink it in preference to your best well water, if wise. If such a water supply could be obtained we believe that the best thing Goldsboro could do for the health of its citizens would be to fill up every surface well in the city and thereby compel its exclusive use. We further believe that the increased consumption would more than re-imburse the water company for the outlay necessary to obtain it.

We beg to say for ourselves, and we believe the opinion would be endorsed by our full Board, that we earnestly deprecate the use in malarial regions of surface water, for the reason that aside from the difficulty of preserving it from contamination there is good ground for the belief that it holds and takes with it into the system the malarial poison. The Board of Health has begun the investigation of this subject and it hopes in the near future to present to the public the evidence of our own people as to its truth.

In conclusion, we wish to express our appreciation of the courteous assistance afforded us by yourself, Mayor Broadhurst and other members of your Board. Very respectfully,

GEORGE GILLETT THOMAS, M. D.,
RICH'D H. LEWIS, M. D.,
Committee.

SMALL-POX.

Considering the prevalence of this disease in so many localities all over the country, and particularly considering, in view of the first named fact, the defenseless condition of our people from want of vaccination, we have been extremely fortunate so far. Only two cases have occurred in our State. One was a refugee from Chattanooga to Cherokee county in December, 1893, and the other a case of varioloid in Wadesboro in the person of a horse drover from Southwest Virginia. The former, rather than submit to the quarantine which Superintendent of Health Abernathy promptly proposed to apply, fled the county and the State, thereby demonstrating in a most satisfactory manner the value of an active, alert health officer. The second case, which was a very mild one, was isolated and all persons exposed as well as numbers of others vaccinated. In this way, by scaring a number of the unvaccinated into that most important step, he served an excellent purpose.

This subject of vaccination, *i. e.*, the practical question of how to get the people vaccinated, remains one of the most important and at the same time the most difficult to which we are called to address ourselves. Attention was called to the prevalence of small-pox in the country and the importance of vaccination in the December Bulletin and again more at length in that for January. Inasmuch as your Secretary's views were fully set forth in the latter article it is unnecessary to take up your time with recounting them beyond repeating that in his opinion nothing but the actual appearance of small-pox in a community would accomplish anything worth mentioning. At the time of the Wadesboro case I ordered one hundred vaccine points in the hope that there might be a demand for them. *Thirty* have been disposed of to date.

VITAL STATISTICS.

While we have made distinct progress in the past year in this branch of our work we are still very far from where we ought to be. It is of course manifestly impossible to obtain accurate statistics from the country districts, and so our efforts have been directed to the towns and cities. We have now twenty-nine towns reporting, as against twenty-five a year ago, Morehead City having discontinued its reports and Lenoir, Pittsboro, Warrenton, Washington and Winston having been added to the list. The total population represented is 144,934, of whom 85,750 are white and 59,204 are colored. The annual death-rate for the former is 12.4 and for the latter 21.7 per thousand. The deaths from consumption were among the whites 115 or 1.33 per thousand, while among the negroes they were 184 or 3.11 per thousand. These figures, while we cannot say they are absolutely reliable in every instance, are so in the main and are both interesting and instructive as showing the difference in mortality in the two races, particularly the great increase of consumption in the colored people, among whom it was in the days of slavery almost an unknown quantity, and as illustrating in a striking manner the effects of comparatively sanitary and very unsanitary conditions.

This question of reliable mortuary statistics is an unusually important one to a State which, like ours, is seeking to attract immigrants of intelligence and character. The health argument is one of our very strongest, but it will have very little weight with the class we have in view unless we can support that argument with facts that cannot be controverted. We have the facts; let us collect them in such a way as to put them above suspicion. To assure reliable statistics from our principal towns and cities a

little personal interest on the part of our physicians living within their gates is all that is necessary. We earnestly hope they will help us in this respect.

THE BULLETIN.

Being thoroughly convinced that the cause of preventive medicine in the State could make no substantial progress without at least the moral support if not the positive aid of the members of the profession, your Secretary has used the monthly publication of the Board as a means of communication with them. Acting under the belief that a member of the Medical Society of the State was *ipso facto* more or less alert and interested in his profession, and wishing to reach that class particularly, the edition of the Bulletin was with the December number increased from about 800 to nearly 1,200 copies and the name of every member of the Society was put upon the mailing list. As you are already aware an effort has been recently made to obtain a reasonable number of subscribers at twenty-five cents per annum in order to allow of its being mailed as second class matter at an annual saving in postage of more than a hundred and forty dollars. But I regret to say that the effort has met with very indifferent success, the total number of subscribers enrolled to date being fifty-three. The effort will, however, be continued until the requisite number is obtained. When that is accomplished it would probably be wise to still further extend its distribution.

MALARIA AND DRINKING WATER.

Believing that the malarial poison is in many if not most instances introduced into the system through the drinking of surface water from shallow wells in the considerable portion of our State in which this class of diseases prevails, a movement was inaugurated in the last Bulletin

to bring about, if possible, a reform in the matter. To that end a circular-letter asking for information upon this subject from those who have had experience with this source of water supply has been sent to every physician in the localities referred to, and to every newspaper with the request to publish. A number of replies have already been received, and it is hoped that a mass of evidence of such a character as to impress the minds of the people interested may be secured for subsequent distribution.

LEGISLATION.

Although the new health law enacted by the Legislature of 1893 was a great improvement in many respects on the Act of 1885, in two particulars it was distinctly worse, viz.: in taking the appointment of a majority of the State Board of Health from the State Medical Society and giving it to the Governor and by reducing the term of office of those elected by the Society from six to two years, the term of the Governor's appointees, instead of raising the latter to six. Some provision should also be made for filling vacancies in the office of Superintendent of Health and certain other minor amendments would be desirable. It is hoped that the Committee on Legislation will bear these matters in mind.

As sight is next to life, and as blindness from ophthalmia neonatorum is largely preventable, it is plainly our duty as guardians of the public health to exert our best efforts to prevent it. It is estimated that there were 5,000 blind from this cause in the United States in 1890, which would mean about 100 for our own State. This sad record should be amended in the coming years. As a step in that direction, and as setting forth the opinion of the leading medical men of the State, I would respectfully suggest the adoption by this meeting of the following preamble and resolutions,

the same being a modification of those adopted by the Section of Opthalmology of the American Medical Association in 1893:

WHEREAS, There are in our State fully one hundred persons hopelessly blind because of inflammation of the eyes occurring immediately after birth; and

WHEREAS, This unfortunate result is largely preventable, being due to the neglect of nurses and midwives; therefore be it

Resolved, That it is the sense of this Conjoint Session of the State Board of Health and the State Medical Society that legislation tending to lessen blindness from this disease similar to that already enacted in a number of the other States is desirable.

Resolved, That the Committee on Legislation of the Medical Society be requested to use their best endeavors, if in their judgment, after the assembling of the Legislature in 1895 it be wise to agitate the subject, to secure the enactment of such a law.

EDUCATION IN HYGIENE.

All our principal health officers are physicians and every physician is, or ought to be, a health officer. It is therefore important that they should be well educated in hygiene. Our Medical Practice Law requires that they shall be, for "Medical Hygiene" is, in the enumeration of the various branches on which it is made the duty of the Board of Medical Examiners to examine applicants for license, made of equal dignity with all other branches. There is reason to believe that most if not all our medical colleges do not devote the time or attention to this subject that its importance demands. I would therefore respectfully suggest for your consideration and adoption this resolution:

Resolved, That the medical colleges of the country be requested to give to the subject of hygiene sufficient time for thorough instruction of their students on that subject not less than two lectures a week.

Resolved further, That our Board of Medical Examiners are hereby requested to require of applicants for license the same preparation on this as on the other branches of medicine named in the Medical Practice Act.

MARITIME QUARANTINE.

It is with great regret that I report the failure so far on the part of the City of Wilmington to avail itself of the opportunity to secure a first-class quarantine station, with all the modern improvements, at Southport. It will be remembered that as the result of the well-planned, earnest efforts of Drs. Thomas, Burbank and others the last Legislature appropriated $20,000 for that purpose upon condition that the City of Wilmington supplement it with $5,000. This condition the Board of Aldermen at its last meeting refused to comply with, proposing instead to ask the United States authorities to take charge. Whether they will do so or not remains to be seen, but in any event it is a great disappointment not to have our own station.

MEETINGS OF HEALTH ASSOCIATIONS.

In obedience to instructions from the President of the Board I attended the Pan-American Medical Congress at its first session in the city of Washington in September last. Being present as a delegate from our State Board of Health, I attended almost exclusively the session on Hygiene, Climatology and Demography.

In October in company with Mr. J. C. Chase I attended the International Congress of Public Health, which met with the American Public Health Association in the city of Chicago. While the number of delegates from abroad was very limited the meeting was both interesting and instructive. At both of these gatherings your Secretary obtained new ideas and had his sanitary zeal quickened.

In conclusion, I am proud to say that in looking back over the past year it is clear that the cause of preventive medicine in North Carolina has gained ground. In addition to the particular things that have been accomplished

as set forth in the body of this report, the interest in the cause on the part of both the profession and the people is greater than it was. I feel that we have a right to "thank God and take courage" in the hope of making still greater progress the coming year.

DISCUSSION.

Dr. Hill asked if the water at Goldsboro might not have been made impure by the decomposition of the vegetable matter in the river.

Dr. Lewis stated that that was the opinion of the Secretary until after the analysis of the river water.

The question was asked if persons drank that water continually would it not show itself in some disease. Dr. Lewis said that a person may drink very filthy water according to the chemical analysis and not be perceptibly hurt, while he may drink a chemically pure water that is contaminated with disease germs and be made sick. It does not follow because persons are not made sick that the water is not impure. The filthiness of the water only affords better opportunity for the development of the germs.

The authorities should receive full power from the Legislature to have charge over the water-shed. The law is of a most rigid character. A man is severely punished for throwing matter which has not been disinfected upon the water-shed.

Dr. Faison said that the water of Charlotte was decidedly foul and full of germs and he wanted to know if there was any arrangement or any money by which the Board might help the city.

Dr. Kinyoun was asked for his advice upon the subject.

Dr. Kinyoun—To explain all the qualities of drinking water, even from the bacteriological point of view, would mean many hours, for there are a great many favorable

opinions and a great many adverse opinions to be given. In answering the query I would say, in regard to bacteriological examinations, the general policy of the Marine Hospital Service, in so far as it could never examine all the kinds of water that would be submitted to it, if it would signify its willingness to do so, is to bring before the authorities of the State the necessity for these examinations, and to encourage home sanitation, which is the sanitation to be desired. The hospital service is now open for instruction of representatives from State and municipal authorities, for the purpose of giving them the necessary information for making these examinations. A complete laboratory for making the experiments is not necessary. It is earnestly desired that the States will give it their official recognition and send representatives. All materials will be furnished *gratis*.

In regard to the character of the water, if the signs of the sewerage of the city should continue to be found in the water, I should unhesitatingly condemn it as suspicious. It is especially so of well water. If you have an examination made of a well, and the analysis proves to be fair or good, it does not follow that within six weeks the water may not become contaminated. The examinations should be made often enough to establish the purity of the water. The apparatus for examining the water is so simple and so inexpensive—the most expense is the microscope and it can be gotten for $75—that the county with a hundred and fifty dollars can purchase sufficient apparatus for the examinations.

The course in Washington is six weeks in duration.

The question was asked that if to a certain sample of water one drop of permanganate of potash be added and the water set aside for an hour or two and still retain the peculiar color would he consider that water drinkable. Or, if he made a solution of nitrate of silver, and if after

an hour there was the slightest milky appearance and no deposit, would he not consider the water contaminated with organic matter.

Dr. Kinyoun—No. I do not. Very frequently the permanganate is clarified by the acid in the water. Unless it has a large amount of organic matter present the test is not worth mentioning in establishing the purity of the water.

Dr. Powers said that he understood from what had been said that anything that is not destructive to bacteria might become favorable to its development. Even if the water is chemically pure they will be present in it in an active state, and when taken into the body, if conditions are favorable, germination will take place. On the other hand, if the water contains a trace of organic matter, and nearly all pure waters do, the germination begins to take place in the water. According to the amount of organic matter in the water depends the strength of the bacteria. We can see in this way how in one year we have a very mild form of a disease and the next year have a very severe form.

The resolutions recommended by the Secretary were unanimously adopted.

Dr. Lewis said, in regard to the prevention of blindness, an objection had been raised that it is impossible to have a law such as this carried out. The law simply requires that the attendant on the appearance of redness of the eyes immediately after birth shall report it to the physician. The main idea is that people have a tendency to follow the law just because it is the law.

The Secretary thanked the County Superintendents for their presence and for the prompt reports they had handed in.

On the motion of Dr. C. J. O'Hagan a vote of thanks was tendered the Secretary.

On motion the Conjoint Session adjourned.

RICH'D H. LEWIS, M. D.,
Secretary.

VITAL STATISTICS.

The collection of full and accurate vital statistics, including births, deaths and marriages, is in the present stage of our sanitary development impossible. Indeed it is impracticable to obtain even mortuary statistics for the whole State, our population being largely rural. So we have confined our efforts to such cities and towns as could be induced to make reports. They have been encouragingly rewarded. The number of cities and towns reporting at the end of 1892 was twenty, representing a total population of 116,799—74,150 white and 42,649 colored, while at the end of 1894 the number of cities and towns was thirty-one, containing 87,350 whites and 61,004 negroes, or a total population of 148,354. Of these thirty-one cities and towns twenty-eight sent in reports for every month in the two years, and our remarks on the death-rate will be based on them.

For the State as a whole, inasmuch as it is in general characteristics divided into three distinct sections, we have thought it best to substitute for the large, unwieldy table showing the diseases prevailing in the State by counties a table (No. I) showing the comparative prevalence of certain of the more important diseases usually reported by the County Superintendents of Health in the three physical divisions of the State. As it is intended to be comparative it is expressed in per cent. so that it may be comprehended more easily. On the whole, with the exception of malarial affections, which are much more prevalent in the Eastern Division or flat country, rapidly diminishing as the elevation increases, the diseases selected for tabulation are quite evenly scattered over the whole State. While

not so pronounced by any means the reverse of the above is true in regard to typhoid fever, which increases with the elevation, the percentage of counties in the east reporting it in 1893 being 33.1, in the center 37.5 and in the west 45.1, and in 1894 35.5, 42.5 and 43.5 respectively. The influence of specifically contaminated drinking water in the production of typhoid fever has long been well known, but the introduction of the malarial poison into the system through the medium of the drinking water is a comparatively new theory. For facts bearing on this subject the reader is referred to an article on "Drinking Water in its Relation to Malarial Diseases" in the Appendix. It is hoped that by its distribution throughout the malarial section the prevalence of that form of disease will be greatly diminished.

The mortuary statistics gathered from the cities and towns referred to above, we regret to admit, are not reliable in many instances. A large number of deaths, we feel constrained by the very low death-rate to believe, are not recorded in some of the towns. It is extremely difficult to secure the adoption and enforcement by the municipalities of the proper methods for securing fullness and accuracy although we are gradually advancing in this as in other respects. On account of their poverty and obscurity as a class it is more than probable that more deaths among the negroes were not recorded than among the whites, so that we feel confident that the death-rate given for the colored is relatively too low, as bad as it already is.

In 1893 the death-rate calculated from all the cities and towns reporting, total population, whites 62,900, colored 46,704, was respectively 13.18 and 20.25. In 1894 in the twenty-eight cities and towns making full reports, total population, whites 83,650, colored 59,604, it was 10.6 and 17.5. The difference in each year was practically the same,

about seven per thousand greater in the colored race, which is presumptive evidence of the truth of the figures. The principal cause of death was consumption. The average death-rate from that disease for the past four years was, whites 1.17 per thousand, colored 3.28. For the purpose of obtaining more accurate *data* we have compiled the following from some of the largest cities whose reports are believed to be reliable:

1893.

Wilmington,	W. 1.66,	per M.	1 in	8.12	of all deaths,	C. 3.84,	1 in	6.06
Raleigh,	W. 1.85,	"	"	1 "	8.84	"	"	"	C. 3.85,	1 "	5.63
Charlotte,	W. 1.33,	"	"	1 "	10.16	"	"	"	C. 4.80,	1 "	5.25

1894.

Wilmington,	W. 1.33,	per M.	1 in	8.41	of all deaths,	C. 3.77,	1 in	6.28
Raleigh,	W. 1.87,	"	"	1 "	8.40	"	"	"	C. 2.57,	1 "	8.38
Charlotte,	W. 2.00,	"	"	1 "	6.83	"	"	"	C. 4.33,	1 "	5.19
Winston,	W. 1.15,	"	"	1 "	8.66	"	"	"	C. 9.37,	1 "	2.95

The average for the three cities in 1893 was whites 1.61, colored 4.16 per thousand, and for the four cities in 1894, whites 1.59, colored 5.01.

This great disparity in the death-rate from consumption is attributable to a number of causes. They are, we think, insufficient clothing, the lack of fire in winter, the want of an abundance of good, nutritious food, the lack of proper care in sickness, the greater prevalence of syphilis among them, that disease being conducive to tuberculosis, and over-crowding in the most insalubrious parts of the cities and towns. It is to be noted that the figures given apply only to the cities and towns. The disease is doubtless less prevalent in the country, but even there it is much more common than formerly.

While no statistical tables of that time bearing on this subject are obtainable, the testimony of the older physicians and citizens generally is to the effect that in the days of slavery consumption was a rare disease among the

negroes. The fact that when in servitude they were warmly clad and well shod, that they had plenty of fire, an abundance of simple but nutritious food, largely of an oily character, the best medical attention promptly supplied, that syphilis was very rare among them, that they were required to live a life of regular hours and that they were never crowded together in the towns, goes to confirm the reasonableness of the views expressed as to the causation of the present sad state of affairs.

In making these investigations it was considered very desirable to have a separate record for whites, blacks and mulattoes, for the purpose of ascertaining the exact facts as to the relative susceptibility of the pure-breds of both races compared with those of mixed race. But it was practically impossible to carry out such a plan with sufficient accuracy to make it worth anything. No question exists, however, in the minds of most medical men who have had opportunities for observation that the cross is full of physical evil. The leading colored practitioner of the State, who is a physician of ability and scientific attainments and of very large personal experience and observation among his own people, informed the writer that the mixed race was much more subject to consumption, scrofula and cancer than the pure blacks, and we can say the same for the whites.

The large death-rate among our colored people, with, we believe, a somewhat diminished birth-rate, though we have no statistics on the latter, is a serious matter looked at from the stand-point of both humanity and economics. We say economics because we feel sure that they could not be replaced by any class of laborers so well suited to our environment or so acceptable to the employers as a whole.

It is a generally accepted fact that the negro is not so susceptible to malarial diseases as the white race. Our

experience is contrary to this opinion, the deaths from malarial fevers in the past two years being more than double among the former than the latter. To be exact, the death-rate from malarial diseases was in 1893, white 0.41, colored 1.17 per thousand: in 1894, white 0.29, colored 0.67. This is due, no doubt, to the fact that most of the colored people reside in the suburbs of the towns, which are always more malarious than the central or thickly settled portions, and to the relative lack of the necessary medicines and nursing, which is the common lot of the poor wherever found.

As is generally the case there are two sides to this question of the relative susceptibility to disease of the two races, and the other side is shown in the statistics of diphtheria. In the past two years twenty-two deaths among the whites were attributed to that disease, while not a single one among the colored was reported. These figures suggest the idea of the comparative immunity to diphtheria on the part of the negro, and the subject deserves and will receive further study.

Renewed efforts will be made to secure greater accuracy in the collection of mortuary statistics as well as the registration of births in our cities and towns, and we hope to make a much better showing in our next report.

TABLE 1.—SHOWING THE COMPARATIVE PREVALENCE OF CERTAIN DISEASES IN THE THREE PHYSICAL DIVISIONS OF THE STATE DURING 1893 AND 1894.

(Eastern Division—Alluvial Plain. Central Division—Hilly. Western Division—Mountainous. The figures under the various diseases represent in per cent. the proportion of the counties mentioning the disease in question to the whole number of counties reporting for the month).

			Whole Number of Counties.	Number Counties Reporting.	Diphtheria.	Dysentery.	Influenza.	Malarial Fever.	Malarial Fever, Hemorrhagic.	Malarial Fever, Pernicious.	Pneumonia	Scarlet Fever.	Typhoid Fever.
January,	E.	1893	36	17	5.9	0.0	17.6	17.6	5.9	0.0	41.2	11.8	17.6
		1894		29	3.4	3.4	72.4	6.9	6.9	3.4	41.4	6.9	17.2
	C.	1893	26	21	14.3	4.8	9.5	0.0	0.0	0.0	28.6	19.0	20.0
		1894		26	7.7	7.7	73.1	0.0	7.7	3.8	57.7	7.7	26.9
	W.	1893	34	18	11.1	0.0	16.7	0.0	0.0	0.0	27.8	5.5	38.9
		1894		34	20.6	0.0	85.2	0.0	0.0	0.0	58.2	5.9	20.6
February.	E.	1893	36	15	0.0	0.0	6.7	20.0	0.0	0.0	53.3	13.3	13.3
		1894		31	3.2	0.0	58.1	0.0	19.3	6.4	35.5	3.2	19.3
	C.	1893	26	19	10.5	0.0	10.5	0.0	0.0	0.0	36.8	15.1	5.3
		1894		26	3.8	3.8	16.1	0.0	0.0	0.0	53.8	7.7	11.5
	W.	1893	34	16	0.0	0.0	0.0	0.0	0.0	0.0	25.0	6.2	6.2
		1894		33	9.1	3.0	15.4	0.0	0.0	0.0	33.3	12.1	12.1
March.	E.	1893	36	18	11.1	0.0	16.1	5.5	0.0	0.0	38.9	11.1	11.1
		1894		30	33.3	33.3	23.3	10.0	10.0	33.3	23.3	16.7	20.0
	C.	1893	26	18	5.5	5.5	11.1	0.0	0.0	0.0	22.2	0.0	27.8
		1894		25	8.0	4.0	40.0	8.0	0.0	0.0	52.0	16.0	12.0
	W.	1893	34	16	6.2	0.0	25.0	6.2	0.0	0.0	25.0	6.2	6.2
		1894		33	6.1	3.0	9.1	0.0	0.0	0.0	12.1	3.0	3.0
April.	E.	1893	36	19	5.3	47.4	10.5	26.3	10.5	0.0	15.8	0.0	36.8
		1894		31	0.0	19.3	0.0	32.2	22.6	3.2	6.5	6.5	9.7
	C.	1893	26	19	0.0	0.0	16.0	0.0	0.0	0.0	31.6	5.3	10.5
		1894		24	0.0	41.7	0.0	4.2	0.0	0.0	12.5	12.5	16.7
	W.	1893	34	20	5.0	10.0	10.0	0.0	0.0	0.0	25.0	10.0	20.0
		1894		30	0.0	23.3	0.0	6.7	0.0	0.0	16.7	3.3	20.0
May.	E.	1893	36	20	10.0	60.0	0.0	40.0	5.0	5.0	10.0	10.0	25.0
		1894		30	6.7	46.7	0.0	36.7	3.3	0.0	0.0	6.7	46.7
	C.	1893	26	19	5.3	42.1	0.0	15.6	0.0	0.0	5.3	10.5	26.3
		1894		25	0.0	48.0	0.0	8.0	4.0	4.0	8.0	8.0	44.0
	W.	1893	34	19	0.0	36.3	5.3	0.0	0.0	0.0	10.5	0.0	21.0
		1894		32	3.1	31.2	3.1	0.0	0.0	3.1	3.1	6.2	46.9
June.	E.	1893	36	20	5.0	55.0	0.0	50.0	10.0	5.0	5.0	10.0	50.0
		1894		28	0.0	21.4	0.0	50.0	7.1	3.6	0.0	10.7	57.1
	C.	1893	26	22	4.5	40.9	0.0	22.7	0.0	0.0	4.5	1.5	27.3
		1894		25	4.0	40.0	4.0	24.0	4.0	4.0	4.0	4.0	60.0
	W.	1893	34	20	5.0	40.0	0.0	0.0	0.0	0.0	0.0	10.0	30.0
		1894		31	6.4	12.9	6.4	19.3	0.0	0.0	0.0	6.4	61.3

TABLE I.—Showing Comparative Prevalence, etc.—Continued.

			Whole Number Counties.	Number Counties Reporting.	Diphtheria.	Dysentery.	Influenza.	Malarial Fever.	Malarial Fever, Hemorrhagic.	Malarial Fever, Pernicious.	Pneumonia	Scarlet Fever.	Typhoid Fever.
July.	E.	1893	36	20	0.0	25.0	0.0	95.0	10.0	15.0	5.0	5.0	24.0
		1894		28	3.6	0.0	0.0	75.0	7.1	10.7	0.0	28.6	67.8
	C.	1893	26	21	23.8	14.3	0.0	28.6	4.8	0.0	0.0	9.5	33.3
		1894		27	0.0	3.7	0.0	40.7	0.0	7.4	0.0	11.1	74.1
	W.	1893	34	20	0.0	15.0	0.0	15.0	0.0	5.0	0.0	0.0	70.0
		1894		30	3.3	6.7	0.0	10.0	0.0	3.3	0.0	0.0	90.0
August.	E.	1893	36	19	5.3	5.3	0.0	68.4	5.3	10.5	0.0	10.5	63.1
		1894		30	3.3	6.7	3.3	83.3	16.7	13.3	3.3	10.0	60.0
	C.	1893	26	18	11.1	0.0	0.0	33.3	0.0	0.0	0.0	16.7	66.7
		1894		25	16.0	4.0	0.0	48.0	4.0	4.0	0.0	20.0	72.0
	W.	1893	34	22	18.2	9.1	0.0	4.5	0.0	0.0	0.0	4.5	95.4
		1894		29	31.0	0.0	0.0	13.8	0.0	3.4	3.4	13.8	86.2
September.	E.	1893	36	26	19.2	3.8	0.0	69.2	19.2	26.9	0.0	7.7	53.8
		1894		29	20.7	3.4	0.0	82.6	27.6	0.0	0.0	24.3	55.2
	C.	1893	26	21	23.8	9.5	4.8	42.8	0.0	9.5	0.0	19.0	66.7
		1894		25	36.0	8.0	0.0	60.0	8.0	0.0	0.0	24.0	56.0
	W.	1893	34	31	32.3	9.7	3.2	9.7	3.2	6.4	3.2	6.4	83.9
		1894		33	27.3	3.0	0.0	18.2	0.0	0.0	6.1	9.1	54.5
October.	E.	1893	36	29	10.3	6.9	0.0	62.1	41.4	27.6	0.0	6.9	37.9
		1894		30	13.3	0.0	6.7	70.0	40.0	23.3	3.3	26.7	36.7
	C.	1893	26	25	24.0	8.0	4.0	28.0	16.0	8.0	0.0	8.0	64.0
		1894		24	20.8	4.2	0.0	50.0	0.0	8.3	4.2	12.5	58.3
	W.	1893	34	31	29.0	3.2	0.0	16.1	3.2	0.0	0.0	16.1	79.4
		1894		31	22.6	0.0	6.4	16.1	6.4	3.2	6.4	16.1	58.0
November.	E.	1893	36	28	7.1	0.0	7.1	60.7	21.4	15.0	3.6	10.7	35.7
		1894		31	16.1	3.2	6.5	41.9	29.0	9.7	16.1	22.6	25.8
	C.	1893	26	26	15.4	3.8	19.2	19.2	11.5	0.0	19.2	19.2	65.4
		1894		26	7.7	0.0	3.8	23.1	3.8	0.0	11.5	19.2	42.3
	W.	1893	34	34	14.4	0.0	38.2	11.7	2.9	2.9	14.4	11.8	58.8
		1894		32	21.9	0.0	12.5	9.4	6.2	0.0	12.5	12.5	40.6
December.	E.	1893	36	28	3.6	0.0	57.2	10.7	10.7	3.6	17.8	14.3	28.6
		1894		29	13.8	0.0	3.8	27.6	20.7	0.0	27.6	31.0	10.3
	C.	1893	26	24	4.2	0.0	79.2	4.2	4.2	0.0	25.0	0.0	37.5
		1894		25	4.0	0.0	16.0	0.0	0.0	0.0	28.0	12.0	36.0
	W.	1893	34	33	12.1	0.0	90.9	0.0	0.0	0.0	36.4	0.0	21.6
		1894		28	17.9	0.0	0.0	0.0	0.0	0.0	28.6	3.6	28.6
Averages for the Year.	1893.	E.	36	21.6	6.9	16.9	9.6	43.8	11.6	9.0	15.9	9.3	33.1
		C.	26	21.1	11.9	10.7	12.9	16.2	3.0	1.5	14.4	10.6	37.5
		W.	34	23.3	11.9	10.3	15.8	5.2	0.8	1.2	13.9	6.4	45.1
	1894.	E.	36	29.7	9.7	11.4	14.5	43.0	17.5	8.9	13.1	16.2	35.5
		C.	26	25.2	9.0	13.8	15.2	22.2	2.6	2.6	17.6	12.9	42.5
		W.	34	31.3	14.1	6.9	14.0	7.8	1.0	1.1	13.4	7.7	43.5
	1893.	State.	96	66.0	10.2	12.6	12.8	21.7	5.1	3.9	14.7	8.8	38.6
	1894.	State.	96	86.2	10.9	10.7	14.6	24.3	7.0	4.2	14.7	12.3	40.5

TABLE II.—Showing the Comparative Prevalence of Disease During the Years 1893 and 1894.

(Of the 96 counties in the State the number sending reports each month is stated at the head of the columns.)

Diseases.		Number of counties reporting, by months.											
		January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
	1893	56	50	52	58	58	62	61	59	78	85	88	85
	1894	89	90	88	85	87	84	85	84	87	85	89	82
Bronchitis	1893	6	1	2	2	--	--	--	--	--	2	6	4
	1894	13	18	14	9	5	1	1	2	3	5	9	5
Cholera (Chicken)	1893	1	--	4	1	3	--	2	1	--	2	2	1
	1894	2	1	3	--	2	6	4	6	2	2	1	--
Cholera (Hog)	1893	2	5	2	6	4	4	3	6	7	9	12	13
	1894	5	8	7	6	7	5	8	11	9	12	9	6
Diarrhœa	1893	--	--	--	--	13	24	14	2	2	--	--	--
	1894	--	--	--	13	35	21	10	4	2	2	--	--
Diphtheria	1893	--	2	4	2	3	3	5	7	20	21	11	6
	1894	10	5	5	1	3	3	2	14	24	16	14	10
Distemper (Horses)	1893	--	2	2	3	--	--	--	1	1	--	--	2
	1894	3	3	3	2	1	2	1	--	1	1	2	2
Dysentery	1893	1	--	1	4	--	28	11	3	6	5	1	--
	1894	3	2	3	23	35	20	3	3	4	1	1	--
Farcy (Horses)	1893	--	--	--	--	--	--	--	--	--	--	--	--
	1895	--	--	--	--	--	--	--	--	1	--	--	--
Influenza ("La Grippe")	1893	8	3	9	7	1	--	--	--	--	1	20	64
	1894	69	45	20	10	1	2	--	1	--	4	9	5
Malarial Fever	1893	3	3	2	5	11	15	23	20	29	30	26	4
	1984	1	--	3	14	13	28	35	41	46	38	22	8
Malarial Fever, hemorrhagic	1893	1	--	--	2	1	2	3	1	6	17	10	4
	1894	4	6	3	7	2	3	2	6	10	14	12	6
Malarial Fever, pernicious	1893	--	--	--	--	1	1	4	2	10	10	5	1
	1894	2	2	1	2	2	2	6	6	9	10	3	--
Measles	1893	2	6	7	7	4	1	1	1	1	--	2	2
	1894	4	4	4	3	8	4	2	2	1	3	5	2
Meningitis (Cerebro-spinal)	1893	--	--	--	--	--	--	1	--	--	--	--	--
	1894	--	--	--	1	--	--	--	--	--	--	--	--
Mumps	1893	2	1	3	2	3	--	--	--	--	--	--	2
	1894	2	3	3	--	1	2	2	1	--	1	2	--
Pneumonia	1893	18	19	15	14	5	2	1	--	1	--	11	23
	1894	40	36	24	10	3	1	--	2	2	4	12	23

TABLE II.—Comparative Prevalence of Disease—*Continued.*

(Of the 96 counties in the State the number sending reports each month is stated at the head of the columns.)

Diseases.		Number of counties reporting, by months.											
		January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
	1893	56	50	52	58	58	62	61	59	78	85	88	85
	1894	89	90	88	85	87	84	85	84	87	85	89	82
Rabies	1893	--	--	1	1	2	--	--	--	1	2	--	--
	1894	1	2	1	2	--	--	--	--	--	--	--	--
Rötheln	1893	--	--	1	1	--	1	--	--	--	--	--	--
	1894	--	--	--	--	--	--	1	1	1	2	1	1
Scarlatina	1893	7	7	4	3	4	5	3	6	8	9	12	4
	1894	6	7	10	6	6	6	11	12	16	16	16	13
Small-pox	1893	--	--	--	--	--	--	--	--	--	--	--	1
	1894	1	--	--	--	--	--	--	--	--	--	--	--
Staggers (Horses)	1893	--	--	--	--	--	--	--	--	--	--	--	--
	1894	--	--	--	--	--	--	1	1	1	--	--	--
Tonsillitis	1893	...	3	2	2	1	--	--	--	--	--	--	2
	1894	--	1	1	2	--	--	1	1	5	2	2	1
Typhoid Fever	1893	16	2	8	13	14	24	30	46	54	51	47	24
	1894	19	13	13	13	40	50	66	67	55	43	32	20
Typho-malarial Fever	1893	--	--	--	--	--	1	1	1	2	5	5	--
	1894	--	--	--	--	1	1	1	2	2	1	1	1
Varicella	1893	--	1	2	1	--	--	--	--	--	--	1	...
	1894	--	3	1	1	2	2	1	--	1	1	3	2
Whooping-cough	1893	10	9	13	11	7	7	10	7	15	19	18	15
	1894	11	22	18	19	17	8	11	13	14	14	15	12

TABLE No. III.—Table of Mortality Reports from Towns for Year Ending December 31, 1893.

TOWNS AND REPORTERS.	Races.	DEATHS BY MONTHS—1893. January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November	December.	Total by Races.	Grand Total.	DEATH-RATE (ANNUAL) PER 1,000 BY MONTHS—1893. January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total by Races. For the Year.	POPULATION. By Races.	Total.
Asheville	W	7	8	14	5	6	13	5	8	10	10	10	11	107		11.2	12.8	22.4	8.0	9.6	20.8	8.0	12.8	15.0	15.0	15.0	16.5	13.5		
Dr. C. E. Hilliard	C	2	7	5	6	3	2	9	3	5	2	3	9	56	163	8.0	28.0	20.0	24.0	12.0	8.0	36.0	12.0	15.0	6.0	9.0	27.0	14.0	13.6	8,000
Dr. H. L. Baird																														4,000
																														12,000
Charlotte	W	12	3	10	6	14	15	10	9	8	16	11	8	122		18.0	4.5	15.0	9.0	21.0	20.0	13.3	12.0	10.7	21.3	13.5	10.7	13.5		9,000
Fred. Nash, Esq.	C	13	12	8	12	8	11	11	11	7	11	8	11	126	248	26.0	24.0	16.0	21.0	16.0	33.6	26.4	26.4	16.8	21.4	19.2	26.4	25.2	17.7	5,000
																														14,000
Durham	W	4	6	3	4	4	3	4	3	1	4	5	2	13		10.7	16.0	8.0	10.7	10.7	8.0	10.7	8.0	2.7	10.7	13.3	5.3	9.5		4,500
Dr. N. M. Johnson	C	3	1	4	3	3	3	3	3	1	0	0	0	27	70	10.3	13.7	13.7	10.3	10.3	10.3	10.3	10.3	3.4	0.0	0.0	0.0	7.7	8.4	3,500
Dr. J. M. Manning																														8,000
Fayetteville	W	0	1	8	1	1	4	4	5	5	3	1	5	38		0.0	4.3	34.3	4.3	4.3	17.1	17.2	21.4	21.4	12.8	4.3	21.4	13.6		2,800
Dr. J. H. Marsh	C	1	0	2	3	2	4	4	1	7	3	7	5	42	80	5.4	0.0	10.9	16.4	10.9	21.8	21.8	21.8	38.2	16.3	38.2	27.3	19.1	16.0	2,200
																														5,000
Goldsboro	W	4	3	2	5	3	3	4	3	2	0	0	1	30		17.4	12.8	8.6	21.4	12.8	12.8	17.2	12.9	8.6	0.0	0.0	4.0	10.0		3,000
Mayor Hollowell	C	2	8	3	1	6	6	7	6	5	1	2	2	52	82	10.9	43.6	16.4	21.8	32.7	32.7	38.2	32.7	22.2	5.4	12.0	12.0	26.0	16.4	2,000
T. H. Bain, Esq.																														5,000
Greensboro	W	1	2		4	3	5	3						18		3.0	6.0		12.0	9.0	15.0	9.0						9.0		1,000
Dr. E. R. Michaux	C	1	0	*a*	0	1	1	4	*a*	*a*	*a*	*a*	*a*	7	25 6 mos.	6.0	0.0	*a*	0.0	6.0	6.0	24.0	*a*	*a*	*a*	*a*	*a*	6.9	8.3	2,000
																														4,000
Henderson	W	1	0	1	1	2	1	3	0	0	4	0	0	13		5.3	0.0	5.3	5.3	10.7	5.4	16.0	0.0	0.0	21.3	0.0	0.0	5.9		2,200
Dr. W. T. Cheatham	C	5	3	1	2	1	1	2	2	3	0	1	4	25	38	30.0	12.7	6.0	12.0	6.0	6.0	12.0	12.0	18.0	0.0	6.0	24.0	12.5	9.0	2,000
																														4,200
Hillsboro	W	2	1	0	0	0	1	1	1	5	1	0	0	12		40.0	20.0	0.0	0.0	0.0	20.0	20.0	20.0	100.0	20.0	0.0	0.0	20.0		600
Dr. D. C. Parris	C	1	0	0	2	0	1	0	0	0	1	0	1	6	18	30.0	0.0	0.0	60.0	0.0	30.0	0.0	0.0	0.0	30.0	0.0	30.0	15.0	18.0	400
																														1,000
Lexington	W	1	1	0	0	0	0	1	0	2	0	0		5	7	8.0	8.0	0.0	0.0	0.0	8.0	0.0	13.3	0.0	0.0		0.0	3.0		1,800
Dr. R. L. Payne, jr.	C	1	0	0	1	0	0	0	0	0	0	0	*a*	0	2 11 mos	40.0	0.0	0.0	40.0	0.0	0.0	0.0	0.0	0.0	0.0	*a*	0.0	7.2	3.1	300
																														2,100

TABLE No. III.—Table of Mortality Reports, etc.—(Continued.

TOWNS AND REPORTERS.	Races.	DEATHS BY MONTHS—1893. January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total by Races.	Grand Total.	DEATH-RATE (ANNUAL) PER 1,000 BY MONTHS—1893. January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total by Races.	For the Year.	POPULATION. By Races.	Total.
Marion	W	2	3	1	0	0	0	1	0	1	0	0	2	1	9	15	55.0	18.4	0.0	0.0	0.0	18.4	0.0	15.9	0.0	0.0	36.9	18.5	13.8	18.7	650	800
Dr. B. A. Cheek	C	2	0	0	0	0	0	2	1	1	0	0	0	0	6		160.0	0.0	0.0	0.0	0.0	160.0	80.0	80.0	0.0	0.0	0.0	0.0	40.0		150	
Monroe	W	1	0	1	1	1	1	1	1	4	0	1	0	12	29	10.0	2.0	12.0	10.0	8.0	8.0	8.0	8.0	32.0	0.0	8.0	0.0	8.0	14.5	1,500	2,000
Dr. W. D. Pemberton	C	3	2	0	0	3	0	2	1	2	0	2	2	17		45.0	30.0	0.0	0.0	72.0	0.0	48.0	24.0	48.0	0.0	48.0	48.0	34.0		500	
Dr. J. M. Blair																															
Morehead City	W	0	2	2	1	1	6	3	*a*	*a*	*a*	*a*	*a*	15	20	0.0	22.0	18.5	9.1	8.9	52.0	26.0	*a*	*a*	*a*	*a*	*a*	18.6	21.2	1,385	1,620
Mayor T. C. Davis	C	0	0	0	1	1	2	1						5	7 mos.	0.0	0.0	0.0	51.1	51.1	102.1	51.1						36.5		235	
Oxford	W	3	3	1	0	0	3	2	3	3	2	1	0	21	56	21.2	21.2	7.0	0.0	0.0	21.2	14.1	21.2	21.2	14.1	7.0	0.0	12.3	16.7	1,700	3,300
Dr. Patrick Booth	C	4	1	6	2	1	5	7	1	1	3	2	2	35		30.0	7.5	15.0	15.0	7.5	37.5	52.5	7.5	7.5	22.5	15.0	15.0	21.2		1,600	
Raleigh	W	9	6	10	13	9	15	10	5	9	8	15	6	115	267	13.5	9.0	15.0	19.5	13.5	22.5	15.0	7.5	13.5	12.0	22.5	9.0	14.4	17.8	8,000	15,000
Dr. James McKee	C	10	6	12	12	13	18	17	15	12	16	12	9	152		17.1	10.3	20.6	20.6	22.3	30.8	29.1	25.7	20.6	27.3	20.6	15.2	21.7		7,000	
Rockingham	W	2	2	0	3	2	2	1	2	0	1	3	0	18	26	20.0	20.0	0.0	30.0	20.0	20.0	10.0	20.0	0.0	10.0	25.7	0.0	12.8	11.8	1,400	1,750
Dr. J. M. Stansill	C	1	1	2	0	0	1	2	0	0	1	0	0	8		24.0	24.0	48.0	0.0	0.0	24.0	48.0	0.0	0.0	24.0	0.0	0.0	22.8		350	
Rocky Mount	W	2	0	0	1	1	2	3	3	1	1	0	3	17	23	30.0	0.0	0.0	15.0	15.0	30.0	30.0	30.0	10.0	10.0	0.0	30.0	14.2	14.4	1,200	1,600
Dr. G. L. Wimberley	C	0	0	1	0	1	0	2	0	0	1	1	0	6		0.0	0.0	30.0	0.0	30.0	0.0	60.0	0.0	0.0	30.0	30.0	0.0	15.0		400	
Salem	W	6	1	6	1	1	5	13	5	2	0	7	2	49	60	18.3	3.0	18.2	3.0	3.0	15.1	39.5	15.2	6.1	0.0	21.3	6.1	12.4	14.0	3,942	4,284
Mayor J. R. Stockton	C	1	1	0	2	3	2	0	0	2	0	0	0	11		35.1	35.1	0.0	70.1	105.3	70.2	0.0	0.0	70.2	0.0	0.0	0.0	32.2		342	
Mayor T. B. Douthit																															
Salisbury	W	3	3	2	3	2	3	1	1	7	1	3		29	62	10.3	12.0	6.9	12.0	8.0	12.0	3.4	3.4	24.0	3.4	10.3	*a*	9.0	13.5	3,500	5,000
Dr. J. J. Summerell	C	1	2	1	3	1	0	1	5	5	3	5	*a*	33	11 mos.	24.0	12.0	32.0	18.0	6.0	0.0	8.0	40.0	40.0	24.0	40.0		24.0		1,500	
Scotland Neck	W	0	1	2	1	0	2	3	1	1	3	0	2	16	21	0.0	17.1	60.0	17.1	0.0	34.3	51.4	17.1	17.1	51.4	0.0	34.3	22.8	19.1	700	1,100
Mayor J. A. Perry	C	0	0	0	0	0	0	1	1	0	1	0	2	5		0.0	0.0	0.0	0.0	0.0	0.0	30.0	30.0	0.0	30.0	0.0	60.0	12.5		400	

TABLE No. III.—Table of Mortality Reports, etc.—Continued.

Towns and Reporters.	Races.	Deaths by months—1893.													Death-rate (annual) per 1,000 by months—1893.												Population.	
		January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total by Races.	Grand Total.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total by Races.	For the Year.	By Races.	Total.
Southport	W	1	0	1	1	2	2	2	1	4	3	0	0	17		15.0	0.0	15.0	15.0	32.0	32.0	32.0	16.0	61.3	48.0	0.0	0.0	22.7	24.2	750	
P. J. Farrell, Esq.	C	2	0	1	0	2	0	2	1	1	0	1	2	12	29	60.0	0.0	30.0	0.0	53.3	0.0	53.3	26.7	26.7	0.0	26.0	54.0	26.7		450	1,200
Statesville	W	0		1	1	5	1	2	0	2		0	2	14		0.0		4.8	4.8	24.0	4.8	9.6	0.0	9.6		0.0	9.6	6.7	5.5	2,500	
Dr. W. J. Hill	C	0	*a*	0	0	0	0	1	0	2	*a*	0	0	3	10 mos.	0.0	*a*	0.0	0.0	0.0	0.0	12.0	0.0	24.0	*a*	0.0	0.0	3.6		1,000	3,500
Tarboro	W	1	1	1	2	3	1	7	1	1	3	1	2	24		9.5	9.5	9.5	19.1	28.6	9.5	66.8	9.4	9.5	28.6	9.5	19.1	19.1	21.1	1,258	
Dr. Donald Williams	C	1	1	1	0	1	4	1	1	6	0	5	2	26	50	10.8	10.8	10.8	0.0	10.8	43.2	43.2	10.8	64.7	0.0	53.9	21.6	23.4		1,112	2,370
Warrenton	W	2	1	0		1		1	0	0	0	0	0	5		36.9	18.5	0.0		16.0		15.0	0.0	0.0	0.0	0.0	0.0	8.0		750	
Dr. P. J. Macon	C	1	1	0	*a*	0	*a*	1	0	0	0	0	1	4	10 mos.	21.8	21.8	0.0	*a*	0.0	*a*	24.0	0.0	0.0	0.0	0.0	21.8	8.7	8.3	550	1,300
Washington	W						2	6	5			2	3	22							9.6	28.8	24.0		9.6	14.4	16.0	14.7	18.0	3,000	
Dr. W. A. Blount	C	*a*	*a*	*a*	*a*	*a*	5	2	9	*a*	2	2	3	23	45	*a*	*a*	*a*	*a*	*a*	30.0	24.0	54.0	*a*	12.0	9.6	18.0	23.0		2,000	5,000
Dr. D. T. Tayloe															6 mos.																
Weldon	W	0	0	0	1	2	0	1	1	1	1	0	0	7		0.0	0.0	0.0	16.0	34.3	0.0	17.1	17.1	17.1	17.1	0.0	0.0	10.0	19.3	700	
Mayor J. T. Gooch	C	1	0	0	1	1	3	6	2	4	1	3	0	22	29	17.1	0.0	0.0	16.0	15.0	45.0	90.0	30.0	60.0	15.0	45.0	0.0	27.5		800	1,500
Wilmington	W	4	7	8	13	9	12	14	12	11	10	11	11	122		4.8	8.4	10.7	15.6	10.8	14.1	16.8	14.4	14.7	13.3	14.7	14.7	13.5	19.3	9,000	
Dr. F. W. Potter	C	18	21	22	13	33	21	29	36	29	32	28	20	303	425	18.0	21.0	22.0	13.0	34.0	21.0	29.0	36.0	26.8	31.1	25.8	18.5	23.3		13,000	22,000
Dr. R. D. Jewett																															
Wilson	W	4	0	2	1	3	2	4	2	4	2	2	3	30		24.0	0.0	12.0	6.0	18.0	12.0	24.0	12.0	24.0	10.0	18.0	18.0	15.0	16.0	2,000	
Dr. A. Anderson	C	1	2	3	2	4	1	3	2	2	2	2	2	26	56	8.0	16.0	24.0	16.0	32.0	8.0	24.0	16.0	16.0	16.	16.0	16.0	17.3		1,500	3,500

TABLE No. IV.—Table of Mortality Reports from Towns for Year Ending December 31, 1894.

TOWNS AND REPORTERS.	Races.	DEATHS BY MONTHS—1894. January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total by Races.	Grand Total.	DEATH-RATE (ANNUAL) PER 1,000 BY MONTHS—1894. January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total by Races.	For the Year.	POPULATION. By Races.	Total.
Asheville	W	13	6	7	8	10	6	6	12	14	10	6	6	104	151*	19.5	9.0	10.5	12.0	15.0	9.0	9.0	18.0	29.0	15.0	9.0	9.0	13.0	12.6	8,000	12,000
Dr. H. L. Baird	C	3	4	7	8	7	7	4	1	1	2	0	3	47		9.0	12.0	21.0	24.0	21.0	21.0	12.0	3.0	3.0	6.0	0.0	9.0	11.7		4,000	
Charlotte	W	9	8	12	15	8	14	10	12	9	8	8	10	123	258	12.0	10.7	16.0	20.0	10.7	18.7	13.3	16.0	12.7	10.6	10.7	12.4	14.7	17.2	9,000	15,000
Fred Nash, Esq.	C	16	1	16	11	9	20	12	12	13	9	8	8	135		38.4	2.4	38.4	22.0	21.6	48.0	28.8	28.8	24.0	18.0	16.0	16.0	22.6		6,000	
Durham	W	3	0	4	3	0	5	4	8	3	1	1	3	35	46	8.0	0.0	10.7	7.2	0.0	12.0	10.7	19.2	8.0	2.7	2.7	8.0	7.8	5.7	4,500	8,000
Dr. J. M. Manning	C	0	2	2	0	0	0	0	0	4	1	1	1	11		0.0	6.8	6.8	0.0	0.0	0.0	0.0	0.0	13.7	3.4	3.4	3.4	3.4		3,500	
Fayetteville	W	2	1	2	3	5	2	4	4	5	6	3	3	40	80	8.6	4.3	8.6	12.8	21.4	8.6	12.8	17.1	21.4	25.7	12.8	12.8	14.3	16.0	2,800	5,000
Dr. J. H. Marsh	C	4	3	1	1	1	5	6	5	3	8	3	0	40		21.8	16.4	5.4	5.4	5.4	27.3	27.3	27.3	16.4	43.6	16.4	0.0	18.2		2,200	
Goldsboro	W	5	1	2	1	3	3	3	7	2	6	4	0	37	62	20.0	3.4	6.8	4.0	10.3	10.3	10.3	28.0	8.0	24.0	16.0	0.0	11.7	12.4	3,000	5,000
T. H. Bain, Esq.	C	0	1	0	1	2	2	3	3	3	6	2	2	25		0.0	8.0	0.0	6.0	16.0	16.0	21.0	18.0	18.0	36.0	12.0	16.0	12.5		2,000	
Greensboro	W	8	3	1	1	3	6	5	3	1	3	2	0	36	106	17.1	6.5	2.2	2.2	6.5	13.1	10.9	6.5	2.2	6.5	4.4	0.0	6.5	13.2	5,500	8,000
Dr. A. R. Wilson	C	10	7	5	5	8	2	9	9	5	6	2	2	70		48.0	33.6	24.0	24.0	38.4	8.0	43.2	43.2	24.0	28.8	9.6	9.6	28.0		2,500	
Henderson	W	3	1	1	0	2	1	0	2	1	1	2	0	14	45	16.0	5.8	5.3	0.0	10.7	5.3	0.0	10.7	5.4	5.3	10.7	0.0	6.2	10.6	2,250	4,250
Dr. W. T. Cheatham	C	5	1	4	2	4	1	3	1	3	3	3	1	31		30.0	6.0	24.8	12.0	24.8	6.0	18.0	6.0	18.0	18.0	18.0	6.0	15.5		2,000	
Dr. W. J. Judd																															
Hillsboro	W	1	0	1	0	1	0	0	0	1	0	0	0	4	13	20.0	0.0	20.0	0.0	20.0	0.0	0.0	0.0	20.0	0.0	0.0	0.0	10.0	18.6	400	700
Dr. D. C. Parris	C	2	3	0	0	0	1	0	0	0	0	1	1	9		60.0	90.0	0.0	0.0	30.0	0.0	0.0	0.0	0.0	0.0	40.0	40.0	30.0		300	
Dr. C. D. Jones																															
Jacksonville	W	*a*	*a*	*a*	*a*	*a*	*a*	*a*	0	1	1	0	0	2	3	*a*	*a*	*a*	*a*	*a*	*a*	*a*	0.0	30.0	30.0	0.0	0.0	12.0	12.0	400	600
Dr. E. L. Cox	C								0	0	0	1	0	1	5 mos.								0.0	0.0	0.0	60.0	0.0	12.0		200	
Lenoir	W				0	2	1	2	0	1	0	0	0	6	10																
Dr. A. A. Kent	C	*a*	*a*	*a*	1	0	0	0	0	0	3	0	0	4	9 mos.	*a*	*a*	*a*	60.0	0.0	0.0	0.0	0.0	15.0	0.0	180.0	0.0	0.0	26.5	13.3	800	1,000
																														200	

TABLE No. IV.—Table of Mortality Reports, etc.—Continued.

TOWNS AND REPORTERS.	Races.	Deaths by months—1894. January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total by Races.	Grand Total.	Death-rate (annual) per 1,000 by months—1894. January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total by Races. For the Year.	Population. By Races.	Total.
Lexington	W	1	1	1	0	1	2	0	0	2	3	0	0	11	11	6.7	6.7	6.7	0.0	6.7	13.3	0.0	0.0	13.3	20.0	0.0	0.0	6.1	5.2	1,800	2,100
Dr. R. L. Payne, Jr.	C	0	0	0	0	0	0	0	0	0	0	0	0	0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		300	
Marion	W	0	1	0	0	0	0	1	0	1	0	1	0	4	8	0.0	18.5	0.0	0.0	0.0	18.5	0.0	18.5	0.0	18.4	0.0	0.0	6.1	10.0	650	800
Dr. B. A. Check	C	1	1	0	0	0	0	0	0	0	0	0	2	4		80.0	80.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	160.0	26.7		150	
Monroe	W	1	0	3	1	1	0	2	1	0	0	0	2	11	21	8.0	0.0	24.0	8.0	8.0	0.0	13.3	6.7	0.0	0.0	0.0	18.9	6.1	8.7	1,800	2,400
Dr. J. M. Blair	C	0	0	5	2	0	0	1	1	0	0	1	0	10		0.0	0.0	120.0	18.0	0.0	0.0	21.0	20.0	0.0	0.0	20.0	0.0	16.7		600	
Oxford	W	0	2	2	2	2	2	1	3	2	1	1	1	19	37	0.0	14.1	14.1	14.1	14.1	14.1	7.0	21.0	14.0	80.0	8.0	8.0	12.7	13.2	1,500	2,800
Dr. Patrick Booth	C	1	0	1	2	3	3	1	3	0	1	2	1	18		7.5	0.0	7.5	15.0	22.5	22.5	7.5	27.7	0.0	9.2	18.5	9.2	13.8		1,300	
Dr. W. O. Baskerville																															
Pittsboro	W	1	1	1	0	0	0	0	0	0	0	1	1	5	7	31.3	31.3	31.3	0.0	0.0	0.0	0.0	0.0	0.0	31.3	31.3	0.0	14.3	11.7	350	600
Dr. L. A. Hanks	C	1	0	0	0	0	0	0	0	0	0	0	1	2		18.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	48.0	8.0		250	
Raleigh	W	11	13	5	8	15	20	10	10	7	11	11	12	126	277	16.5	19.5	7.5	12.0	22.5	30.0	15.0	15.0	10.5	16.5	6.0	18.0	15.7	18.5	8,000	15,000
Dr. James McKee	C	17	11	6	11	18	17	11	12	15	12	11	9	151		29.1	21.0	10.3	18.8	30.8	25.7	21.0	20.6	25.7	20.6	18.8	10.0	21.6		7,000	
Rockingham	W	0	2	1	0	1	1	2	5	3	0	0	1	16	19	0.0	18.5	8.9	0.0	9.2	9.2	18.5	16.1	27.7	0.0	0.0	9.2	12.3	10.8	1,300	1,750
Dr. J. M. Covington	C	0	0	0	0	0	0	0	2	1	0	0	0	3		0.0	0.0	0.0	0.0	0.0	0.0	53.3	26.7	0.0	0.0	0.0	0.0	6.7		150	
Rocky Mount	W	1	0	0	1	1	1	3	2	1	0	0	1	11	17	10.0	0.0	0.0	10.0	10.0	10.0	30.0	20.0	10.0	0.0	0.0	10.0	9.2	10.6	1,200	1,600
Dr. G. L. Wimberley	C	2	0	0	2	0	1	0	1	0	0	0	0	6		60.0	0.0	0.0	60.0	0.0	30.0	0.0	30.0	0.0	0.0	0.0	0.0	15.0		100	
Salem	W	3	0	1	0	6	3	1	1	1	5	6	6	36	44	9.1	0.0	3.3	0.0	18.3	9.1	3.0	12.2	3.0	17.7	18.3	18.3	9.1	10.5	3,912	4,284
Mayor T. B. Donthit	C	0	0	0	0	2	1	0	1	3	0	0	1	8		0.0	0.0	0.0	0.0	70.2	35.1	0.0	35.1	105.3	0.0	0.0	35.1	23.4		372	
F. E. Kechlin, Esq.																															
Salisbury	W	0	1	3	1	3	3	1	0	1	1	3	7	25	55	0.0	3.1	10.3	3.4	10.3	10.3	13.7	0.0	3.1	3.1	10.3	21.0	7.7	11.0	3,500	5,000
Dr. John Whitehead	C	2	1	0	2	2	3	5	3	2	1	3	1	28		16.0	8.0	0.0	16.0	16.0	24.0	10.0	21.0	16.0	32.0	24.0	8.0	18.7		1,500	

TABLE No. IV.—Table of Mortality Reports, etc.—Continued.

Towns and Reporters.	Races.	Deaths by months—1894.														Death-rate (annual) per 1,000 by months—1894.												Population.	
		January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total by Races.	Grand Total.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total by Races.	For the Year.	By Races.	Total.
Scotland Neck.	W	0	0	1	1	2	2	0	0	1	2	0	0	9	24	0.0	0.0	17.1	17.1	34.3	34.3	0.0	0.0	17.1	34.3	0.0	0.0	12.8	21.8	700	1,100
Mayor J. A. Perry.	C	1	1	3	0	0	3	0	0	3	2	0	2	15		30.0	30.0	90.0	0.0	0.0	90.0	0.0	0.0	90.0	60.0	0.0	60.0	37.5		400	
Southport	W	1	1	1	0	1	1	1	0	1	0	1	0	8	15	16.0	16.0	16.0	0.0	16.0	16.0	16.0	0.0	16.0	0.0	16.0	0.0	10.7	12.5	750	1,200
E. H. Crammer, Jr., Esq	C	1	0	0	0	0	3	0	0	0	2	0	1	7		26.6	0.0	0.0	0.0	0.0	80.0	0.0	0.0	0.0	53.3	0.0	26.7	15.5		450	
L. A. Galloway, Esq																															
Statesville	W	1	1	2	1	1	1	0	0	1	0	1	*a*	9	11	4.8	4.8	9.6	4.8	4.8	4.8	0.0	0.0	4.8	0.0	4.8	*a*	3.9	3.4	2,500	3,500
Dr. W. J. Hill	C	0	1	0	0	0	0	0	0	0	0	1		2	11 mos	0.0	12.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.0		2.2		1,000	
Tarboro	W	2	2	1	1	2	0	0	2	3	1	2	0	16	31	19.1	19.1	9.6	8.5	19.1	0.0	0.0	19.1	28.6	9.5	19.1	0.0	12.7	14.3	1,258	2,370
Dr. Donald Williams	C	2	0	3	1	1	2	1	1	2	2	0	3	18		21.6	0.0	32.4	10.8	10.8	21.6	10.8	10.8	21.6	21.6	0.0	32.4	16.2		1,112	
Warrenton	W	0	1	0	0	0	1	1	0	0	1	1	1	6	7	0.0	16.0	0.0	0.0	0.0	16.0	16.0	0.0	0.0	16.0	15.0	15.0	8.0	5.4	750	1,300
Dr. P. J. Macon	C	0	0	0	0	0	0	0	0	0	0	0	1	1		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.0	0.0	1.8		550	
Washington	W	3	4	2	2	5	3	1	3	4	3	3	2	35	100	12.0	16.0	8.0	8.0	21.0	14.4	4.8	14.4	16.0	12.0	12.0	8.0	11.7	20.0	3,000	5,000
Dr. D. T. Tayloe	C	6	4	7	7	1	3	1	4	5	15	4	8	65		36.0	24.0	42.0	42.0	4.8	14.4	4.8	19.2	24.0	90.0	24.0	38.4	32.5		2,000	
Dr. J. C. Rodman																															
Weldon	W	2	1	0	2	2	0	1	0	1	2	1	1	13	30‡	31.3	17.1	0.0	34.3	34.3	0.0	17.1	0.0	17.1	34.3	17.1	17.1	18.6	20.0	700	1,500
Mayor J. T. Gooch	C	1	2	3	1	3	0	1	1	2	0	2	1	17		15.0	30.1	15.0	15.0	45.0	0.0	15.0	15.0	15.0	0.0	30.0	15.0	21.2		800	
Wilmington	W	6	4	10	12	13	6	9	6	10	10	6	9	101	409	8.0	5.3	13.3	16.0	17.3	8.0	12.0	8.0	14.4	13.3	6.9	12.0	11.2	18.6	9,000	22,000
Dr. R. D. Jewett	C	26	31	25	20	28	25	32	24	31	27	17	22	308		21.8	28.6	23.1	18.5	25.8	23.1	29.5	22.1	28.6	24.9	15.7	20.3	22.9		13,000	
Wilson	W	1	0	1	3	1	3	2	5	1	4	1	2	27	53	6.0	0.0	6.0	18.0	6.0	18.0	12.0	30.0	24.0	24.0	6.0	12.0	13.5	15.1	2,000	3,500
Dr. Albert Anderson	C	1	1	1	0	3	2	5	2	3	3	1	4	26		8.0	8.0	8.0	0.0	24.0	16.0	40.0	16.0	24.0	24.0	8.0	32.0	17.3		1,500	
Winston	W	2	3	5	1	8	7	3	3	4	3	3	10	52	185	4.0	6.9	11.5	2.3	18.5	16.1	6.9	6.9	8.3	6.9	6.9	23.1	10.0	18.5	5,200	10,000
Dr. John Bynum	C	19	7	13	8	17	18	12	9	4	7	7	12	133		47.5	17.5	32.3	20.0	42.5	15.0	30.0	22.5	10.0	17.5	17.5	30.0	27.7		4,800	

‡Of this total 5 deaths were of visitors, two of them accidents.

TABLE No. V.—Showing Causes of Death for the Year Ending December 31, 1893.

TOWNS.	RACES.	POPULATION. By Races.	POPULATION. Total.	Typhoid Fever.	Scarlet Fever.	Malarial Fever.	Diphtheria.	Whooping-cough.	Measles.	Pneumonia.	Consumption.	Brain Diseases.	Heart Diseases.	Neurotic Diseases.	Diarrhœal Diseases.	All Other Diseases.	Accident.	Suicide.	Total Deaths. By Races.	Total Deaths. By Towns.	Under 5 Years. By Races.	Under 5 Years. By Towns.	Still-born. By Races.	Still-born. By Towns.	REMARKS.
Asheville	White	8,000	12,000	3	0	0	0	3	0	16	23	2	13	4	10	24	1	1	107	163	29	55	10	20	
	Colored	4,000		0	0	0	0	0	0	7	11	0	6	1	7	20	2	0	56		26		10		
Charlotte	White	9,000	14,000	12	0	0	1	1	0	11	12	6	16	3	24	36	2	1	122	248	10	72	9	32	
	Colored	5,000		5	0	3	0	0	0	11	21	6	12	5	12	33	5	1	126		32		13		
Durham	White	4,500	8,000	2	1	0	2	0	1	6	5	0	2	2	1	12	1	0	33	70	16	29	3	3	
	Colored	3,500		2	0	0	0	0	1	2	7	0	1	0	5	8	1	0	37		4		0		
Fayetteville	White	2,800	5,000	1	0	0	2	0	0	2	1	0	1	1	4	24	1	0	38	80	5	25	3	9	
	Colored	2,200		1	0	0	0	0	0	1	7	0	1	0	1	18	0	1	42		8		6		
Goldsboro	White	3,000	5,000	1	0	0	0	1	0	1	3	0	3	1	4	12	0	0	30	82	11	27	2	8	
	Colored	2,000		0	0	1	0	0	0	5	11	2	3	0	8	18	1	0	52		16		6		
Henderson	White	2,200	4,200	0	0	0	0	0	0	0	1	0	2	0	1	9	0	0	13	38	2	10	0	0	
	Colored	2,000		0	0	0	0	0	0	1	7	1	0	1	4	8	0	0	25		8		0		
Hillsboro	White	600	1,000	0	0	0	1	0	0	0	1	0	0	0	0	8	0	0	12	18	0	1	1	1	
	Colored	400		0	0	0	0	0	0	1	2	0	0	0	0	2	1	0	6		1		0		
Marion	White	650	800	0	0	0	0	0	0	0	3	0	0	0	4	0	0	0	9	15	0	0	1	1	
	Colored	150		1	0	0	0	0	0	0	2	0	0	0	3	0	0	0	6		0		0		
Monroe	White	1,500	2,000	0	0	0	2	0	0	1	1	0	0	0	0	3	1	0	12	29	0	2	2	3	
	Colored	500		0	0	0	0	0	0	4	4	0	2	1	2	4	1	0	17		2		1		
Oxford	White	1,700	3,300	2	0	0	0	0	0	2	0	2	2	2	3	7	0	0	21	56	10	21	3	6	
	Colored	1,600		2	0	0	0	0	0	3	3	0	1	2	2	18	1	0	35		11		3		
Raleigh	White	8,000	15,000	6	0	0	5	2	1	1	0	11	13	5	10	0	7	51	3	2	115	267	33	102	12	25	
	Colored	7,000		2	0	0	0	0	2	0	0	5	27	7	7	1	15	78	3	0	152		63		13		
Rockingham	White	1,100	1,750	1	1	0	0	0	0	0	1	0	1	0	0	5	3	1	0	0	18	26	7	9	1	1	
	Colored	550		0	0	0	0	0	0	0	1	0	0	0	0	1	1	2	0	0	8		2		0		
Rocky Mount	White	1,200	1,600	6	0	0	0	0	0	0	1	2	3	1	0	0	4	2	0	0	17	23	0	1	0	0	
	Colored	400		2	0	0	0	0	0	0	0	0	1	0	0	1	0	0	6		1		0		
Salem	White	3,942	4,284	2	0	0	0	0	0	0	2	2	3	0	6	0	3	22	0	0	19	60	17	20	0	0	
	Colored	342		1	0	0	0	0	0	0	2	2	0	0	0	2	4	0	0	0	11		3		0		
Scotland Neck	White	700	1,100	0	0	1	0	0	0	0	0	0	2	0	1	2	0	0	0	0	16	21	2	2	2	2	
	Colored	400		0	0	0	0	0	0	0	0	2	1	0	1	1	0	0	0		5		0		0		

TABLE No. V.—Showing Causes of Death, etc.—Continued.

TOWNS.	RACES.	POPULATION. By Races.	POPULATION. Total.	Typhoid Fever	Scarlet Fever.	Malarial Fever.	Diphtheria.	Whooping-cough.	Measles.	Pneumonia.	Consumption.	Brain Diseases.	Heart Diseases.	Nervous Diseases.	Diarrhœal Diseases.	All Other Diseases.	Accident.	Suicide.	Total Deaths. By Races.	Total Deaths. By Towns.	Under 5 Years. By Races.	Under 5 Years. By Towns.	Still-born. By Races.	Still-born. By Towns.	REMARKS.
Southport	White.	750	1,200	0	0	0	0	0	0	0	1	3	1	0	1	11	0	0	17	29	11	14	0	0	
	Colored	450		1	0	0	0	0	0	0	2	0	0	0	0	8	1	0	12		3		0		
Tarboro	White...	1,258	2,370	3	0	0	0	0	0	3	32	2	2	0	4	4	0	0	24	50	6	20	0	0	0
	Colored	1,112		3	0	2	0	0	0	3		1	2	0	6	6	0	0	26		14		0		
Weldon	White...	700	1,500	0	1	2	0	0	0	0	0	0	0	0	1	3	0	0	7	29	2	11	3	5	5
	Colored	800		0	0	2	0	0	0	1		0	0	0	3	11	2	0	22		8		3		
Wilmington	White...	9,000	22,000	5	0	11	1	1	0	7	15	7	11	1	15	38	3	1	122	125	31	111	7	38	38
	Colored	13,000		5	0	30	0	4	1	7	50	16	29	9	41	105	3	0	303		113		31		
Wilson	White.	2,000	3,500	3	0	3	1	1	0	1	4	4	1	3	1	4	1	0	30	56	11	11	0	0	0
	Colored	1,500		0	0	3	0	0	0	0	2	0	1	0	4	18	0	1	26		3		0		
Total, 20 towns	White...	62,900	109,604	56	3	26	10	4	1	77	93	11	82	23	100	281	11	5	822	1785	241	571	57	146	146
	Colored	16,704		23	0	55	0	11	1	60	167	35	67	20	122	373	23	3	963		327		89		
Grand Total...		109,604		89	3	81	10	15	8	137	260	79	149	43	222	657	34	8	1785		571		146		
Greensboro	White.	5,500	8,000	0	0	0	0	0	0	0	2	1	2	2	4	7	0	0	18	25	13	13	0	0	0
	Colored	2,500		0	0	1	0	0	0	0	0	0	1	0	1	4	0	0	7		0		0		For six months—January, February, April, May, June and July.
Lexington.....	White...	1,800	2,400	0	0	0	0	0	0	0	1	0	1	0	1	1	1	0	5	7	2	2	0	0	0
	Colored	600		0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	2		0		0		For eleven months; November omitted.
Morehead City..	White...	1,385	1,620	0	0	0	0	1	0	1	1	2	3	0	2	4	1	0	15	20	7	11	0	1	1
	Colored	235		0	0	1	0	1	0	0	1	0	0	0	0	2	0	0	5		4		1		For the first seven months.
Salisbury	White...	3,500	5,000	2	0	0	0	0	1	5	5	0	1	1	3	12	0	0	29	62	5	9	2	2	2
	Colored	1,500		5	0	1	0	0	0	3	5	0	1	1	1	13	3	0	33		4		0		For eleven months; December omitted.
Statesville	White...	2,500	3,500	1	0	0	0	0	0	1	0	0	1	0	1	8	2	0	11	17	1	1	2	3	3
	Colored	1,000		0	0	0	0	0	0	0	1	0	1	0	0	1	0	0	3		0		1		For ten months; February and October omitted.
Warrenton.....	White...	750	1,300	0	0	0	0	0	0	0	0	2	0	0	1	2	0	0	5	9	2	3	0	0	0
	Colored	550		0	0	0	0	0	0	0	3	0	0	0	1	0	0	0	4		1		0		For ten months: April and June omitted.
Washington.....	White...	3,000	5,000	1	1	5	0	0	0	1	1	2	2	1	4	4	0	0	22	45	5	9	0	0	0
	Colored	2,000		1	1	1	0	0	0	1	2	2	0	3	4	8	0	0	23		4		0		For six months—June, July, August, Oct., Nov. and Dec.

TABLE No. VI.—Showing Causes of Death for the Year Ending December 31, 1894.

TOWNS.	RACES.	POPULATION. By Races.	POPULATION. Total.	Typhoid Fever.	Scarlet Fever.	Malarial Fever.	Diphtheria.	Whooping-cough.	Measles.	Pneumonia.	Consumption.	Brain Diseases.	Heart Diseases.	Neurotic Diseases.	Diarrhœal Diseases.	All other Diseases.	Accident.	Suicide.	Violence.	Total Deaths. By Races.	Total Deaths. By Towns.	Under 5 Years. By Races.	Under 5 Years. By Towns.	Still-born. By Races.	Still-born. By Towns.	REMARKS.
Asheville	White	8,000	12,000	4	0	0	6	0	0	7	*31	1	10	1	11	30	2	1	0	101	157	27	43	6	10	
	Colored	4,000		2	0	0	0	0	0	3	9	1	3	0	0	25	1	0	0	47		16		1		
Charlotte	White	9,000	15,000	9	1	3	1	0	0	9	18	5	1	5	21	47	3	0	0	123	258	47	88	11	24	
	Colored	6,000		10	0	4	0	0	0	11	26	13	9	4	11	39	8	0	0	135		41		13		
Durham	White	4,500	8,000	1	0	6	0	0	0	1	7	2	2	1	5	13	0	0	0	35	46	4	6	1	1	
	Colored	3,500		3	0	0	0	0	0	2	1	0	1	0	0	3	0	0	1	11		2		0		
Fayetteville	White	2,800	5,000	2	0	4	0	0	0	0	1	4	2	1	2	19	2	0	0	40	80	13	24	1	1	
	Colored	2,200		0	0	5	0	0	0	2	3	0	2	2	2	23	1	0	0	40		11		3		
Goldsboro	White	3,000	5,000	0	0	4	0	0	0	3	4	1	1	0	6	17	1	0	0	37	62	11	13	1	2	
	Colored	2,000		0	0	2	0	1	0	1	5	1	2	0	4	8	1	0	0	25		11		1		
Greensboro	White	5,500	8,000	5	0	0	0	0	0	1	21	4	4	4	2	11	1	0	0	36	106	6	32	2	15	
	Colored	2,500		1	0	1	0	0	0	2	2	3	3	5	3	21	2	1	0	70		26		6		
Henderson	White	2,250	4,250	0	0	0	0	0	0	1	2	1	0	0	1	9	0	0	0	14	45	1	10	2	5	
	Colored	2,000		2	0	0	0	0	0	2	2	2	1	0	2	13	0	0	0	31		9		3		
Hillsboro	White	400	700	0	0	0	0	0	0	0	0	0	0	3	0	1	0	0	0	4	13	0	0	0	0	
	Colored	300		0	0	0	0	0	0	0	1	0	0	1	0	7	0	0	0	9		0		0		
Lexington	White	1,800	2,100	4	0	0	1	0	0	1	1	0	0	0	0	4	0	0	0	11	11	1	1	1	1	
	Colored	300		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0		0		
Marion	White	650	800	2	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1	8	1	2	0	0	
	Colored	150		0	0	0	0	0	0	1	0	0	0	0	1	0	2	0	0	4		1		0		
Monroe	White	1,800	2,400	2	0	1	0	1	0	0	1	0	0	0	0	4	0	0	0	11	21	0	0	2	2	
	Colored	600		0	0	0	0	0	0	0	5	0	1	0	2	4	0	0	0	10		0		0		
Oxford	White	1,500	2,800	1	0	0	0	0	0	0	2	3	2	0	2	9	0	0	0	19	37	8	10	2	5	
	Colored	1,300		1	0	0	0	0	0	3	3	3	0	2	2	4	0	0	0	18		2		3		
Pittsboro	White	350	600	0	0	0	0	0	0	2	0	0	0	0	0	3	0	0	0	5	7	0	0	0	0	
	Colored	250		0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	2		0		0		
Raleigh	White	8,000	15,000	6	0	2	1	0	0	11	15	11	9	4	18	46	3	0	0	126	277	39	94	8	29	
	Colored	7,000		0	0	2	0	1	0	8	18	11	9	6	11	80	4	0	1	151		55		21		

*Of this total 26 deaths, of consumption, were of visitors.

TABLE No. VI.—SHOWING CAUSES OF DEATH, ETC.—CONTINUED.

TOWNS.	RACES.	POPULATION. By Races.	POPULATION. Total.	Typhoid Fever.	Scarlet Fever.	Malarial Fever.	Diphtheria.	Whooping-cough.	Measles.	Pneumonia.	Consumption.	Brain Diseases.	Heart Diseases.	Neurotic Diseases.	Diarrhœal Diseases.	All Other Diseases.	Accident.	Suicide.	Violence.	Total Deaths. By Races.	Total Deaths. By Towns.	Under 5 Years. By Races.	Under 5 Years. By Towns.	Still-born. By Races.	Still-born. By Towns.	REMARKS.
Rockingham....	White...	1,300	1,750	1	0	0	1	0	0	0	2	5	3	1	0	3	0	0	0	16	19	1	1	0	1	
	Colored	450		1	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	3		0		1		
Rocky Mount.	White...	1,200	1,600	2	0	1	0	0	0	0	2	1	0	0	0	3	2	0	0	11	17	0	0	0	0	
	Colored	400		1	0	0	0	0	0	0	1	2	0	1	0	0	0	0	0	6		0		0		
Salem	White...	3,942	4,281	2	1	0	1	0	0	0	0	3	1	3	0	7	18	0	0	36	44	17	19	3	3	
	Colored	312		0	0	0	0	0	0	0	1	1	0	1	0	2	3	0	0	8		2		0		
Salisbury	White...	3,500	5,000	2	0	0	0	0	0	0	2	4	7	0	0	10	1	1	0	27	54	12	9	2	3	
	Colored	1,500		2	0	0	0	0	0	0	3	5	1	1	0	1	3	0	0	27		7		1		
Scotland Neck..	White..	700	1,100	0	0	0	1	0	0	0	0	3	0	1	1	3	0	0	0	9	24	4	11	0	0	
	Colored	100		0	0	0	1	0	0	0	1	2	1	0	0	1	0	0	0	6		3		0		
Southport	White...	750	1,200	0	0	0	2	0	0	0	1	0	0	0	0	1	2	0	0	4	15	1	6	0	0	
	Colored	450		0	0	0	1	0	0	0	0	2	0	0	0	0	4	0	0	7		2		0		
Tarboro	White...	1,258	2,370	0	0	0	2	0	0	0	1	2	0	3	0	2	5	0	1	16	34	3	5	0	0	
	Colored	1,112		0	0	0	2	0	0	1	1	2	0	3	0	3	6	0	0	18		2		0		
Warrenton	White..	750	1,300	0	0	0	0	0	0	0	0	0	0	3	0	1	2	0	0	6	7	0	2	0	0	
	Colored	550		0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1		0		0		
Washington	White...	3,000	5,000	1	0	0	0	1	1	1	3	2	0	0	4	23	1	1	0	35	100	5	22	1	1	
	Colored	2,000		2	0	3	0	2	0	1	5	2	0	5	1	0	41	3	0	65		17		0		
Weldon	White...	700	1,500	1	0	0	0	0	0	0	0	1	1	0	1	5	1	0	0	13	*30	1	6	0	1	
	Colored	800		0	0	2	0	0	0	0	7	0	1	0	0	6	1	0	0	17		2		1		
Wilmington	White...	9,000	22,000	2	2	3	0	0	0	5	12	8	12	1	9	41	5	1	0	101	409	32	133	15	56	
	Colored	13,000		5	1	16	0	0	0	14	49	25	13	0	29	117	9	0	0	308		111		41		
Wilson	White...	2,000	3,500	1	0	2	0	0	0	0	5	1	1	2	4	10	1	0	0	27	53	6	17	6	6	
	Colored	1,500		0	0	1	0	0	0	2	0	0	0	0	1	19	0	0	0	26		11		0		
Winston	White..	5,200	10,000	3	0	0	1	0	0	3	6	10	2	1	5	19	2	0	0	52	185	32	68	7	7	
	Colored	4,800		4	0	0	0	2	0	3	15	4	10	0	22	39	1	0	0	133		16		10		
Total, 28 towns	White...	82,850	142,254	51	4	25	12	2	1	56	127	70	57	24	122	318	23	4	0	926	2113	217	634	79	188	
	Colored	59,404		35	1	40	0	6	1	63	222	70	67	22	112	500	36	1	2	1187		387		109		
Grand Total...	.....	142,254		86	5	65	12	8	2	119	349	140	124	46	234	857	59	5	2	2113		634		188		

*Of this total 5 deaths were of visitors, two of them accidents.

TABLE No. VI.—SHOWING CAUSES OF DEATH, ETC.—CONTINUED.

TOWNS	RACES	POPULATION		Typhoid Fever.	Scarlet Fever.	Malarial Fever.	Diphtheria.	Whooping-cough.	Measles.	Pneumonia.	Consumption.	Brain Diseases.	Heart Diseases.	Neurotic Diseases.	Diarrhœal Diseases.	All Other Diseases.	Accidental.	Suicide.	Violence.	Total Deaths. By Races.	Total Deaths. By Towns.	Under 5 Years. By Races.	Under 5 Years. By Towns.	Still-born. By Races.	Still-born. By Towns.	REMARKS.
Jacksonville	White	400	600	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	2	3	0	0	0	0	For five months, Aug., Sept., Oct., Nov. and Dec.
	Colored	200		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0		0		
Lenoir	White	800	1,000	0	0	0	0	0	0	1	0	2	0	0	2	2	0	0	0	7	10	4	4	0	0	For nine months, Jan., Feb. and March omitted
	Colored	200		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3		0		0		
Statesville	White	2,500	3,500	0	0	0	0	0	0	1	0	2	0	0	2	2	0	0	0	7	13	3	3	0	0	For eleven months, December omitted.
	Colored	1,000		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6		0		0		

SPECIAL WORK OF THE BOARD SINCE THE LAST ANNUAL REPORT OF THE SECRETARY TO THE CONJOINT SESSION OF THE BOARD AND STATE MEDICAL SOCIETY.

REPORT ON SANITARY INSPECTION OF THE STATE INSTITUTIONS, AND THE WATER SUPPLY AND SEWERAGE DISPOSAL OF CITIES.

By J. C. Chase, Engineer of the Board.

In accordance with the action of the State Board of Health at a meeting held at Salisbury on the 14th of September I have made a sanitary inspection of the various public institutions and cities of the State, and submit the following report:

The institutions visited are as follows: The Hospitals for the Insane at Raleigh, Morganton and Goldsboro; the Penitentiary and the Convict Camps on the Roanoke and at Castle Hayne; the Agricultural and Mechanical Colleges at Raleigh and Greensboro; the Schools for the Deaf and Dumb at Raleigh and Morganton; the Schools for the Blind at Raleigh; the State Normal School at Greensboro, and the University at Chapel Hill.

I find the sanitary conditions at these various places generally good, taking into account the limitations of the surroundings and specific use of the premises. The buildings are universally situated on eminences of more or less prominence, so that the question of surface drainage has naturally settled itself. The natural surroundings have been improved as a general thing and the grounds are usually well kept and attractive. This feature undoubtedly has a greater

effect on the health, happiness and general well-being of those subjected to its influence than on first thought would be deemed possible, and therefore merits attention in a sanitary inspection.

THE HOSPITALS FOR THE INSANE.

The one at Raleigh gets its general water supply from a small branch over a mile distant, which is pumped to tanks in the attic. The supply for culinary purposes is stored in closed tanks. Drinking water is procured from a deep well and a spring, the latter being several hundred feet from the building and at a much lower elevation. The sanitary fixtures are of an antiquated type and could well be supplanted with something more in accordance with modern ideas. Ventilation of the closets is effected by a downward draught, caused by a connection with the hot air flue of the chimney. Apparently it is not always reliable. The building is heated by steam, with indirect radiators in the basement, fresh air being supplied through an underground conduit by a large rotary fan in the boiler-house. Ventilation is accomplished by means of flues running to the attic, with registers in each room, the attic being provided with suitable ventilators. The state of the weather being such that the windows were generally open, I could not say how thoroughly the wards were ventilated. The sewage is discharged into a branch about one-fourth of a mile distant. On account of the slight flow of water in the branch at times a good deal of the filth is deposited not far from the outfall. A small, covered catch-basin at the outlet of the sewer to retain the solids would abate this nuisance, and the contents could be removed and buried from time to time or used in a compost heap.

The general condition of the institution and its surroundings is satisfactory. The water-closets in the admin-

istration building should be replaced at once with an improved kind, for the impression it would have on visitors, if for no other reason, and a better system of filtration would no doubt render the present water supply suitable for all purposes, which would add much to the conveniences of the institution.

At Morganton the water supply comes by gravity from a mountain stream, some five miles away, and its quality is first-class. This supply not being fully adequate, another for use in an emergency has been obtained from driven wells located in a valley about one-third of a mile away.

The sanitary fixtures, heating and ventilation are virtually the same as in the institution at Raleigh, except that this being of more recent construction many improvements in details have been made. The sewage is discharged at a good distance from the buildings and everything pertaining to the sanitary equipment is maintained in a high degree of efficiency. I consider, however, that the type of water-closet in the wards could be changed to advantage when the proper time comes.

The Goldsboro institution gets its water from Little river, only a few hundred feet away. It has also had an artesian supply, which is not now in use on account of some defect in the well. The river water is more or less turbid at all times, and I consider filtration desirable and essential. The sewage is discharged into deep water in the same stream, some distance below the pumping station, and in this particular the institution is more favored than any other in the State.

The building is heated with hot air, a large rotary fan in the boiler-house forcing a supply of fresh air through a large box coil of steam-pipes and delivering it to registers in the corridors and rooms. The ventilating is done by the usual flues. The plumbing was thoroughly overhauled

a few years ago, the "Durham" system of house drainage being put in. The fixtures require a little more attention than they have had, and if the suggestions and instructions given are followed will probably operate better hereafter. I consider water-closets with automatic flushing far superior to the intermittent type, and fully believe that in four-fifths of the wards of all three institutions an automatic closet could be used with perfect satisfaction, and in this particular I consider that a very decided and desirable improvement can be made.

THE PENITENTIARY AND CONVICT CAMPS.

The water supply of the Penitentiary comes from springs located in the excavation of the old quarry just outside of the enclosure. A large quantity is in this basin and care is taken to exclude all surface drainage. The water appears to be of excellent quality, but is not used for drinking purposes, that being supplied from another source. The heating, which is done by steam, sanitary arrangements and ventilation are all of the usual character found in such institutions, and due regard appears to be paid to the health and comfort of the prisoners.

The water-closets and urinals in the hospital and administration departments could be very materially improved upon, but there is no immediate necessity of a change. When it takes place, however, all wood-work about urinals and closets should be dispensed with, tiling being used instead. The sewage is discharged just outside of the wall, and I should consider it advisable to continue the pipe a few hundred feet further to a branch. If the flow of water should be insufficient to carry off the filth it would be necessary to put in a catch-basin to retain the solids, as described on a preceding page. The hog-pens are in close proximity to the prison, and I fear if they were

owned by other parties they would be adjudged a nuisance by the prison officials.

The convict camps are in good condition and faithfully cared for. The water supply comes from deep and driven wells and appears to be of good quality. The privies receive careful and systematic attention each day and are kept in far better condition than those of the same type in any other State institution, and I doubt if the care taken at the camps is excelled anywhere. At Castle Hayne the percentage of sick was very much larger than at the other camps, but they were principally malarial cases and are no doubt caused by the large amount of excavation going on. I would advise the construction of cisterns at this camp in order to provide a supply of drinking water, but care should be taken to have the roofs washed clean from any deposit of dust from the ground rock before collecting the water. At all of the camps I consider it advisable to carry the foul water by a drain-pipe to a much greater distance than is now done, as there is considerable stagnant water in all of the open drains. In three cases an extension of a few hundred feet will reach running water. At Caledonia a large amount of ditching has been done and the draining of the swamps has resulted in a great improvement in the health of the convicts.

THE A. & M. COLLEGE AT RALEIGH.

This institution gets its supply of water from a large well on the premises. There are no sanitary fixtures in general use on account of the difficulty of disposing of the sewage, objections having been made to discharging it into the nearest branch by parties living farther down. The kitchen wastes are discharged at a good distance from the building and on a lower level than where the well is located.

The privies are of the box pattern and are not as well

taken care of as is desirable. The old well on the campus, which is used very little, if any, should be discontinued entirely. I see no reason why the sewage of this institution could not be disposed of with good success by surface irrigation, or filtration, and the resulting effluent could be discharged into the neighboring branch without any danger of causing a nuisance.

THE A. & M. COLLEGE AT GREENSBORO (COLORED).

This institution was not entirely completed at the time of my visit.

The only water supply is a comparatively shallow well near the kitchen. The water was somewhat turbid on account, I presume, of the newness of the well. The kitchen slops are thrown out in the rear of the building. Ordinary surface privies are the only convenience of the kind available. It is hardly to be expected, perhaps, that sanitary fixtures would be provided where a supply of water was not easily available, and where the question of sewage disposal might be a troublesome one, but to erect a building of this character in this age of the world without providing in the least for the future addition of such conveniences is a serious reflection on the intelligence or far-sightedness of some one.

A supply of water should be delivered into the kitchen, at least, and a suitable drain-pipe provided to take the waste water to a point where it can be discharged with impunity; certainly to a point beyond all danger of contamination to the present water supply. The sewage of this institution could probably be successfully disposed of by surface irrigation. The buildings are heated by hot water and the school building has the usual type of flue ventilation, but the flues terminate in the attic, of which there is no means of ventilating except by the windows.

THE SCHOOL FOR THE BLIND AT RALEIGH.

The water for general purposes comes from large wells on the premises and when the quantity they yield is insufficient the deficiency is made up by drawing from the city water-works. The drinking water comes from another well used exclusively for that purpose, and appears to be of good quality. The plumbing has lately been reconstructed and is now in good condition, with fixtures well adapted to the use required. The building is heated by steam. The rooms containing the water-closets require better ventilation and a device was suggested to the Superintendent to be put in the upper sash of the window. The general condition of the grounds and buildings is a credit to those in charge.

THE SCHOOL FOR THE DEAF, DUMB AND BLIND AT RALEIGH (COLORED).

The greater portion of the water used comes from a deep well on the premises, and the balance from the city water-works. The building is heated with steam and connected with the city sewerage system. The only means of ventilation are the windows and doors. The water-closets are of the latrine type and something better is imperatively needed in the interests of cleanliness and decency. The room containing the closets for the girls should be better ventilated. Some explanations and instructions given to the new Superintendent will probably tend to better the state of affairs to some extent. In other respects nothing was noticed that calls for mention.

THE SCHOOL FOR THE DEAF AND DUMB AT MORGANTON.

This institution has been in operation but a few weeks, and the building and fixtures were in an unfinished state at the time of my visit. The water supply is derived from

deep pipe wells situated in a valley about one-fourth of a mile from the buildings, and is first-class in quality. The sewage is discharged about the same distance away and on a lower level and at some distance from the source of water supply.

The building is well supplied with water fixtures of the proper design and well arranged. Heating is done by steam, direct-indirect radiators being used in the rooms, with air-ducts extending through the exterior walls of the building, so that a supply of fresh air is available, if the matter receives proper attention. Ventilation is secured by floor and ceiling registers opening into flues that extend through the roof.

This being the newest institution, it is only reasonable to expect that its sanitary equipment should be an improvement upon those previously built. Dr. R. H. Lewis, Secretary of the Board, accompanied me, and a more detailed report of our visit has been sent to the Superintendent of the school, to whom we are indebted for many courtesies.

THE STATE NORMAL SCHOOL AT GREENSBORO.

This school has been in operation but a few years, and therefore the buildings are of modern construction. They are heated by steam, with radiators of the direct-indirect type, so that a supply of fresh air is insured. The rooms are ventilated by the usual style of flues, with floor and ceiling registers. The water supply for domestic purposes comes from the city water-works system and the drinking water from a deep well on the grounds. The building has been arranged for sanitary fixtures, but they were omitted on account of the difficulty of sewerage disposal.

At present the kitchen wastes are discharged through a drain into a water course several hundred feet distant. The

privies are of the usual box type, and are apparently well taken care of.

THE UNIVERSITY AT CHAPEL HILL.

There were no sanitary conveniences at the University until last year, when the basement of the library building was fitted up for that purpose with a fair number of water-closets, urinals, bath-tubs and shower-baths for the number of students in attendance.

The water supply comes from a deep well on the campus, sunk for the purpose, and is pumped by steam to tanks in the attic of one of the buildings. A number of fire hydrants have been put in: also several attachments where a convenient supply of water for the dormitories may be drawn. At these places provision has also been made for emptying the slops from the rooms, suitable connections with the sewer having been put in. The pipes have also been extended to the various laboratories, where a supply of water has been very much needed.

The sewage is discharged into a small branch about a thousand feet from the buildings, and no fear of trouble arising from that method of disposal is apprehended. The supply of drinking water is supposed to come from the old well on the campus, but as the new supply is rather more convenient, and is also equally as palatable, it will no doubt be used to a greater or less extent, and it behooves those in authority to see that the new well is kept free from contamination.

A statement of the visits to the various cities follows in detail.

ASHEVILLE.

The water-works are owned by the city. The supply comes from the Swannanoa river, several miles away, filtered by a mechanical plant, so that a more or less turbid

supply is made highly satisfactory. The filter plant has been doubled in capacity the past year. The isolation of the plant would incline one to the belief that there is danger of its not receiving the attention necessary to insure the best results.

The city has a sewerage system built from plans furnished by E. W. Bowditch, C. E., which is apparently complete in all of its parts, except the omission of automatic flush-tanks. The outfalls into the river should be extended a few feet, so as to discharge into deep water. As it is, quite an amount of filth is deposited near the outlets at certain stages of the water, and even if it has no deleterious effect on the neighboring inhabitants, it certainly does not add to the attractiveness of the locality. The outfall that empties into the creek should be extended several hundred feet to the river, as quite a nuisance is created below the present point of discharge, and it is not to be wondered at that complaint has already arisen.

By desire of the Mayor I visited the city market, guard-room, some of the school buildings and library; also the Normal and Collegiate Institute. I am pleased to say that the sanitary arrangements at these various places are generally satisfactory and kept in good condition. The County Home was also visited with the Superintendent of Health. The location, surroundings and general appearance suggested nothing requiring criticism. The jail is a brick structure of the modern type, with the usual sanitary arrangements. On account of the United States Court being in session the jail was in a very overcrowded state, no less than *ninety-five* being confined in quarters intended for hardly more than one-third of that number. The cage was crowded to such an extent that the victims had literally standing room only, and the foulness of the atmosphere and filthiness of the surroundings are virtually indescribable.

If, as was intimated, the cupidity of the sheriff contributed to bring about this particularly reprehensible state of affairs it is high time that the community should rise in indignant protest and demand a more humanized and enlightened service from its officials. If the Government officials are alone responsible, then it is a pity that the much vaunted "strong arm of the law" cannot reach the offender and correct an abuse that would lead to the indictment of the perpetrator in many parts of the country, even if the victims were nothing but brutes. I am informed that the ordinary condition of the jail is creditable to the person in charge. The sanitary conveniences of the court-house are not a credit to the county.

CHARLOTTE.

Water-works owned by a company. Supply taken from two small streams in the outskirts of the city. Water-shed of one is reasonably free from danger of pollution, that of the other is open to some suspicion. The supply becomes quite turbid at times from surface washings in spite of precautions taken to remedy the difficulty by separation and sedimentation. A filtration plant would seem to be the best and perhaps the only solution of the question of a satisfactory water supply for this city. The condition here, however, is no worse than it is in several other cities of the State. The city is well sewered, but some of the outlets should be extended a few hundred feet to deep water, in order to abate a nuisance that exists at these outfalls.

The close proximity to the city of the streams into which the sewers discharge will require, at no distant day, the construction of two intercepting sewers, in order that the sewage may be carried to a sufficiently remote point before its final discharge. The system is not provided with manholes to any extent, or with automatic flush-tanks, and in

that respect is not up to the standard of present practice in sewer construction.

CONCORD.

This city has a small system of water-works owned by an individual. Source of supply, a well, fed by a deep-seated spring, near the center of the town. The water appears to be first-class, and the only criticism to be made is that greater precautions should be taken against pollution by an inflow of surface water, or foreign substances dropping into the well. The owner very cheerfully expressed his willingness to raise the wall and ground about the well so that surface water would flow away from it, and also enclose the well with a roofed building.

No sewerage system. Deep wells, or cess-pools, are used by parties having water-closets. Such devices merit general condemnation, as they are a perpetual menace to the healthfulness of the habitations using them, and are only tolerated as useful nuisances. The local conditions are such that a suitable sewerage system could be provided at a moderate cost, as there is no uncertainty about the locality of disposal, the distance to which it would have to be carried is not excessive and the fall would be ample.

DURHAM.

The water supply comes from an impounded branch some eight miles from town, the reservoir being on a hill about six miles away. The water became very turbid after rains and a filter plant was put in last year. The results have been exceedingly satisfactory and the water supplied to this city is equal in appearance to that supplied to any city in the State. Alum is used as a coagulant. The works are owned by a company. No sewerage system, which is rather a reflection on the enterprise of this progressive and wide-awake city.

ELIZABETH CITY.

No water-works or sewerage. Rain-water cisterns and driven wells in general use. Experiments have been made to obtain a supply from artesian wells, but the results were unsatisfactory. Prospective source of supply would be the Pasquotank river above the town, which would furnish a juniper water of presumably good quality. Sewerage disposal would be rather difficult on account of the flatness of the town site and its very slight elevation above the river. Surface drainage needs attention and the small creeks that intersect the town should be dredged or cleaned out, and the adjacent swamps drained, the grade being raised if practicable by filling in. County Home compares favorably with other like institutions. Surface drainage and an open ditch carrying waste water should have attention, and the advisability is questioned of continuing to use the exceedingly shallow wells on the premises when a plentiful supply from a lower depth could be had by another driven well. The jail is a brick structure of modern design, but had no occupants at the time.

FAYETTEVILLE.

A water-works system built by a company was put in operation last year. Supply taken from an old mill-pond on a creek about one and one-half miles from the city. The pond is fed by springs to a great extent and the water-shed is quite free from danger of pollution. Some surface washing after heavy rains makes the water turbid near the pumping station, but this can be very easily remedied by an intercepting ditch, and should this be done this city will have apparently the best natural water supply in the State. There is also a small gravity system which has been in use for sixty-five years. No system of sewerage. The prospective

means of disposal would be the river, or the creek below the lowest dam. A meeting of the County Board of Health was held in order that I might meet them.

GREENSBORO.

Water-works owned by a company. Supply comes from a creek about a mile from the city. The creek is very muddy at times and an effort is made to insure clear water by storing the normal flow in a settling basin to be used as a supply during the time the creek is at its worst.

This scheme is evidently not an entire success, and this system is unqualifiedly one where filtration should be adopted. Plans were prepared some years ago by E. W. Bowditch, C. E., for a system of sewers, and one outfall and a small portion of the system has been built. It was intimated that some changes in the plans were contemplated, but it is to be hoped that such will not be the case, at least without the advice of a competent engineer, as the one who furnished the plans is without question more of an authority on the subject than any municipal committee on sewers. The jail was visited by request and in company with one of the prominent physicians. The sanitary conveniences are of the most primitive type and a disgrace to the county, when it is taken into account that the jail is situated in the heart of a flourishing city, which is provided with water-works and sewers. The surface drainage also needs attention.

GOLDSBORO.

Water supply under private ownership, and derived from Little river, one and one-half miles from the city. Water very turbid at times and water-shed not above suspicion. This is considered a case where filtration is essential and if faithfully carried out would doubtless remove any proper

cause for complaint arising from the character of the supply or local conditions of the water-shed. No system of sewers.

A franchise was granted last year but the parties have failed to materialize. The natural method of disposal would be by discharge into the Neuse or creeks tributary thereto, but the conditions are favorable for disposal by irrigation or filtration at a much nearer locality.

HENDERSON.

The water-works are owned by a company and have been in use for about three years. Supply derived from an old mill-pond on a small creek about two miles from town. The pond and creek are fed to quite an extent by springs, but the water becomes somewhat turbid from surface washings. The city supply is purified, however, by a filter built in a crib some distance from the shore, and the water furnished is apparently unexceptionable. The water-shed is reasonably free from danger of contamination, both present and prospective. Some apprehension has been expressed in regard to the drainage of a portion of the town reaching the pond through a small branch, in the event of the town being built up in that direction, but the danger can probably be avoided by cutting an intercepting ditch and diverting the drainage into a branch discharging below the dam. No sewerage system. The prospective disposal in the event of a system being built will apparently not be a serious problem.

NEWBERN.

Water-works with an artesian well supply have quite recently been put in operation. The works are owned by a company. An analysis shows the water to be of a satisfactory quality. Cisterns and driven wells are in general

use. A sewerage system on the franchise plan has also recently been constructed. The sewage is discharged into the Neuse through two twelve-inch pipes terminating where the water is from eight to ten feet deep, some four hundred and fifty feet from the shore.

Some fears have been expressed in regard to a possible nuisance resulting from this method of disposal, but the quantity is so small, compared with the volume of water in the river, that I do not apprehend any trouble from that source. The sewer grades are so light, on account of the flatness of the country, that systematic and thorough flushing will be required to keep the system in good order.

RALEIGH.

Water-works owned by a company. Supply comes from Walnut creek, about two miles from the pumping station and above all supposed sources of contamination. The water is also filtered by one of the mechanical devices, alum being used as a coagulant to some extent. The water-shed is some ten miles long, fairly well settled, and as the population is naturally going to increase, the chances of specific pollution are also going to be greater each year. I consider the chances of good water for this city depend to a very great degree upon thorough and faithful filtration. A complete system of sewers designed by J. L. Ludlow, C. E., was built some years ago. The sewage is discharged through four outfalls into running water at a satisfactory distance from the city, and where no reasonable complaint can be made. The system is provided with automatic flush-tanks, but on account of a disagreement with the Water Company they are not used, the flushing being done once a week from a hydrant.

REIDSVILLE.

No public water supply, and a prospective source is not particularly manifest. The question of sewage disposal will

be much easier of solution, for like all of the cities in the central and western sections of the State it is only necessary to take it far enough away and turn it loose. There will be no one farther down stream to be damaged, for several generations at least.

SALEM.

Public water supply owned by a company and derived from several springs of excellent quality. No sewerage system, but the city has the right to connect with the Winston outfall sewers, which pass through the city. The unsightly appearance of a small branch in the city would suggest the propriety of requiring the textile manufactory to discharge its wastes into the sewer. It may not be detrimental to the public health, but appearances should be considered to some extent.

SALISBURY.

Public water supply under corporate ownership. The water is taken from a small stream about two miles from the city. It is filtered by one of the mechanical devices, using alum as a coagulant. The resulting effluent is very satisfactory in appearance, and if the filtration is faithfully done the water supplied is no doubt above reproach, although the immediate surroundings at the point from whence the supply is drawn are not very inviting, as the stream flows through a swamp made of alluvial deposit, and at times the supply must be very turbid. A large amount of mud recently removed from the stand-pipe emphasizes the necessity of continuous and faithful filtration, and I believe it is only by so doing that this supply can be made a satisfactory one. The exigencies of the case would also demand a duplicate filter in order to secure the best results at all times. No sewerage system.

STATESVILLE.

The question of water-works has been discussed, but nothing has been done. The proposed source of supply is a small creek at some distance from town. It is safe to assume that the water will have to be filtered, as any stream in this locality would become very muddy after heavy rains. A sewerage system will not be a serious matter to arrange for when the time arrives.

TARBORO.

This city has put in a small water-works system for fire protection only. The supply being taken from a creek at a point below undoubted pollution, precludes the idea of the present system ever being used for domestic purposes.

Attempts have been made to procure an artesian supply, but the results have apparently not been very promising. The present domestic water supply is from dug and driven wells and rain-water cisterns. The most natural method of sewage disposal would be to discharge it into the Tar river and the problem would probably be easy of solution.

WASHINGTON.

No public water supply or sewers, and the question of providing either will be quite a serious one, as there is apparently no water available except the highly colored river water, which is also very muddy at times, and the natural surface of the ground is so slightly elevated above the river that it would be difficult to construct a system of sewers that would discharge into the river by gravity alone. The present urgent need of this place is surface drainage, as stagnant water was observed in at least two localities on inhabited lots. At the time of my visit a drain was being relaid for the purpose of abating a nuisance of this description. A shallow creek or branch, bordered by swamps,

bounds one side of the town, and is without doubt a contributing cause for the large amount of malarial disorder prevalent. It is quite likely that the river water could be made a satisfactory source of supply by mechanical filtration, using the proper coagulant, and it is possible that an artesian supply might be obtained.

WILMINGTON.

Water-works owned by a company. Supply taken from the north-east branch of the Cape Fear river, about a mile above the city. An attempt was made to get a supply from an artesian well, but at a depth of five hundred feet a flow of saline water was struck and the experiment was abandoned. The present supply is of the same character as that found in the rivers in the eastern part of the State, and is also somewhat turbid at times on account of the muddy water of the other branch of the river being backed up by the tide. Frequent and recent analyses show this water to be of fair quality, or as good as waters of this class are generally found, and free from any specific pollution. The erection of a filter plant is now under consideration and will probably be done at an early date. The city has no system of sewers, although plans for one were prepared by Rudolph Hering, C. E., some years ago. A large number of private sewers have been laid, but no definite plan has been followed, the pipe has not been laid to the proper depth, there are no man-holes or arrangements for flushing, and all that has been done on this line will be virtually thrown away whenever the time comes for constructing a complete system. This city, however, is not the only one that has followed this short-sighted policy. The County Home and Jail are brick structures recently built and well adapted for the purposes for which they were designed. The sanitary condition of each is good.

WILSON.

The water-works are owned by the city and have been in use a little more than a year. The supply comes from Toisnot creek, about one and one-half miles from town, and above any possible source of prospective sewage contamination. The water is variable in quality, as the creek becomes turbid after rain, and the only method of improving its condition is by a small settling basin across which the full flow of the creek passes. At its best the water is of good quality, apparently, but as the creek drains a swampy region we would naturally expect an excess of organic impurity at certain seasons of the year.

While this supply takes a high rank among the natural water supplies of the State, we consider it advisable and necessary that it should be filtered, and the presence of good material near by would render the solution of the problem quite an easy one, when the small quantity of water consumed is taken into account. Plans for a comprehensive system of sewers have been prepared by J. L. Ludlow, C. E., and it is expected that some portion of the system will be built the coming year. The plan provides for the discharge of the sewage by several outfalls into creeks at a good distance from the town, and if the specifications submitted are intelligently carried out we have no doubt of the results being perfectly satisfactory.

WINSTON.

The water-works built by a company some years ago have been purchased by the city and an additional supply is being obtained. The present supply is from wells and the new one is a small branch fed by springs, which gives a very satisfactory water when not turbid from heavy rains.

Intercepting ditches have been cut to keep out muddy water from quite a portion of the water-shed as well as any

household drainage. An ingenious device will be used to keep the muddy storm water from the upper end of the branch out of the clear water basin, and, in addition, the new supply will be passed through a mechanical filter. The water-shed is quite free from danger of pollution and with a slight amount of attention to guard against contamination this city will have a water supply equal, if not superior, to any in the State. A system of sewers was built a few years ago from plans of J. L. Ludlow, C. E. The outfall empties into a deep water creek at some distance from habitations, and where the effluent should cause no complaint.

SUMMARY.

To summarize: Of the twenty cities visited sixteen have water-work systems, fifteen of which supply water for domestic use. Thirteen of the systems have corporate ownership. Of the fifteen six make use of filtration in order to furnish a satisfactory supply, and it is considered that the supplies of five others should have the same treatment; the four remaining seem to require no attention at the present time.

Of the fifteen cities with domestic water supply only five have systems of sewerage in operation, either wholly or in part, while two others have had plans prepared of which they have made no use.

ANALYSES.

Analyses of the water supplies for institution or city use have been available in only a few cases, and but few of those are entitled to much credence, as they are not of recent date. It is now a well-settled fact that in order to know the true character of a water supply it should be examined frequently, and I consider it essential that a chemical analysis be made of a sample from each source

of supply at least once a year, and that a bacteriological examination be made as well. In this way only can we get an intelligent idea of the true character of the water supplied to our citizens or be made aware of the changes that are taking place. Semi-annual or quarterly examinations would be still more desirable.

DISPOSAL OF GARBAGE.

Although not mentioned specifically as one of the objects of this inspection, I have taken occasion to inquire into the methods of disposal in the various cities of what is known as garbage: that is, the rubbish from houses, stores, lots and streets. I find that the usual custom is to have it carted away by the city teams and deposited where it is supposed no offense will be caused, which result is not universally the case. In a few cities the accumulation is burned from time to time, but not until it has a chance to be pretty thoroughly overhauled by the local rag-pickers. Our cities are too small, with perhaps two or three exceptions, to adopt a system of garbage cremation, and the method above mentioned is probably the best to pursue under existing circumstances, but it is highly desirable that the places for dumping should be at a distance from habitations and in some suitable excavation that will prevent the loose stuff from being promiscuously strewn about the vicinity. The burning should take place as soon as sufficient has accumulated to make a satisfactory fire, and it is questionable if the overhauling of the rubbish by the rag-pickers should not be prohibited, for reasons that hardly need setting forth.

It would hardly seem necessary to say that such material should never be used for filling streets, yet such has been the case in some of our cities and in close proximity to habitations.

The stable manure is usually hauled away by the farmers for fertilizing purposes. The contents of the privies in

many of the smaller cities are buried on the lot from time to time, and, as no effort is made to have it absorbed by contributing to plant growth, the condition of the well waters in the vicinity must sooner or later cause apprehension.

In the larger cities the privies are usually cleaned by scavengers who dispose of the *excreta* by dumping it on waste land at a distance from the city. Sometimes it is buried at a much nearer point and occasionally a portion finds its way into a compost heap.

The owner, or occupant, makes his own trade with the scavenger, and frequently the mandatory powers of the city health officer are required to insure that the matter has proper attention. Inasmuch as the expense is borne by the individual in any event, it would seem advisable to have the city assume the work of cleaning the privies and provide for the expense in the general tax levy. It would then be done more methodically, with greater efficiency and with probably no more expense to the average taxpayer: certainly no more than it will cost him if he has been in the habit of having the work done properly heretofore.

These matters, excepting the financial part, are all within the purview of the local health officer, who is usually reasonably faithful to his trust and if the state of affairs is not satisfactory it is more probable that it results from the interference of some ward politician than the efficiency of the health officer. It is seldom that the latter is able to hold his own and require a faithful compliance with the sanitary ordinances when the offender is a person of wealth and influence and chooses to make a fight.

RECOMMENDATIONS.

The character of the water used in the manufacture of ice should also receive attention, and I consider that it is

desirable and proper that the Board should take some action in this line. The quality and character of the milk supplied for city use would also be a legitimate field for investigation, and it is popularly assumed that the milk question and the water question are not very distantly related.

In conclusion, I desire to acknowledge my indebtedness to the various officials and citizens with whom I have been brought in contact during the past few weeks, and extend to them my hearty thanks for their attention and cordial co-operation in enabling me to carry out the work in which I was engaged.

WILMINGTON, December 29, 1894.

QUARANTINE STATION AT SOUTHPORT.

In obedience to instructions given by the Board at its annual meeting at Greensboro I addressed the following letter to Surgeon General Wyman of the United States Marine Hospital Service:

NORTH CAROLINA BOARD OF HEALTH,
SECRETARY'S OFFICE,
RALEIGH, N. C., May 25, 1894.

Walter Wyman, M. D., Supervising Surgeon General United States Marine Hospital Service, Washington, D. C.

DEAR SIR:—After a conference with Passed Assistant Surgeon J. J. Kinyoun, representing yourself and the Service, the North Carolina Board of Health, at its recent meeting on the 16th instant in the city of Greensboro, unanimously passed the following motion:

"Moved, that in view of the inability or unwillingness of the city of Wilmington to contribute its part towards carrying out the act of the last General Assembly providing for the erection of a first-class quarantine station at Southport, the Secretary be instructed to officially request the United States Marine Hospital Service to take charge of and operate that station; and that the Secretary be authorized to explain this action on the part of the Board."

In obedience to the instructions above given I hereby officially re-

quest you, as representing the United States Marine Hospital Service, to take charge of and operate the quarantine station at Southport.

Should you accede to our request, thereby bringing your Service into closer relations with our Board, we feel that we can count with confidence upon a continuance of the same cordial spirit of co-operation that has always existed between us.

In explanation of the action of the Board I would say: Dr. George G. Thomas, a member of our State Board of Health and Secretary of the Board of Quarantine of the Port of Wilmington, N. C., realizing the importance of a first-class quarantine station at the mouth of the Cape Fear, has been working for it for many years. At the last session of the General Assembly, in 1893, ably assisted by Dr. T. S. Burbank, of the Board of Quarantine, and others, and by the cholera scare, he succeeded in obtaining an appropriation by the State for that purpose of $20,000, conditioned, however, upon its being supplemented by an appropriation to the same object of $5,000 on the part of the city of Wilmington. The Board of Aldermen of that city at a recent meeting declined to make the appropriation, and appointed a committee to confer with you on the subject.

While the sentiment of the State Board of Health is in favor of local control as far as practicable, it was, as above stated, unanimous in the opinion that, under the existing circumstances, it would be best for you to take charge of this station. We trust you can do so.

The Board regretted your inability to be present in person; but as that could not be, they appreciated your sending as your representative, in response to our invitation, one so agreeable and so entirely acceptable in every way as Dr. Kinyoun.

Hoping that we may look forward to the pleasure of having you with us at some meeting in the near future, I am

Very respectfully yours,

RICH'D H. LEWIS,
Secretary.

The trust was accepted by the Marine Hospital Service, and I am glad to say that Congress has appropriated $25,000 for the construction of a station with all the modern improvements and $5,000 a year for its maintenance. The plans have been drawn and the station will no doubt be completed and equipped by the time the quarantine season arrives.

While it is of the greatest importance that every means should be utilized to prevent the introduction of infection from abroad, and while our city of Wilmington and our

State at large have a right to feel safer with such a station as that contemplated at the mouth of the Cape Fear, simple justice requires that we should call attention to one fact. It is this: Dr. W. G. Curtis, who has been quarantine officer at Southport for nearly twenty years, although supplied only with the crudest and most inadequate appliances, has, by his skill, alertness and attention to duty, prevented the entrance of infectious diseases. It is to be hoped that his merit will be rewarded by his retention in his present position by the United States Government.

ANALYSES OF DRINKING WATER.

The Board of Health desires to place on record its appreciation of the kindness of the North Carolina Agricultural Experiment Station, Dr. H. B. Battle, Director, in making a large number of chemical analyses of drinking waters and of the United States Marine Hospital Service, Walter Wyman, M. D., Supervising Surgeon General, and Passed Assistant Surgeon Jos. J. Kinyoun, Superintendent of Laboratory, for bacteriological examinations.

The only chemical analyses of special interest have already been referred to in the report on the water supply of Goldsboro.

The bacteriological examinations were of two samples taken respectively from the lower well and the lower spring at the Caraleigh Mills near the city of Raleigh, among the operatives of which typhoid fever was prevailing. All those attacked obtained their drinking water from the lower well. The examination of this water, while not revealing the bacillus of Eberth, the specific germ of typhoid fever, showed the presence in very large numbers of the *bacillus coli communis*, thereby demonstrating its "strong contamination with fecal matter." As the first case of fever

made its appearance two months before the examination was made, and as the typhoid bacillus is not so viable as other intestinal species, the inference was drawn that the lower well was in all probability the source of infection.

It is proper in this connection to say that the Marine Hospital Service has kindly offered to give in its laboratory at Washington free a six weeks' course of instruction in practical sanitary bacteriology, including the bacteriological examination of drinking waters, to accredited representatives of the State Board of Health. Drs. Albert Anderson of Wilson and W. T. Pate of Gibson Station, having expressed a desire to take this course, and also having agreed to do a reasonable amount of work for the Board without charge, were duly commissioned and will go on about the middle of January.

The specific contamination of drinking water can only be ascertained by the bacteriologist. The prompt and certain discovery of the source of infection is all-important in the prevention of a spread of the disease. It is evident, therefore, that we may expect much good to result to the people of the State from having in our midst skilled men in the service of the Board.

While it has no bearing on drinking water we desire to make our acknowledgments to the Marine Hospital Service for a further offer of instruction in the bacteriological diagnosis of diphtheria to representatives of the State Board and of municipal Boards of Health in cities of 10,000 or more inhabitants. Since the discovery of antitoxine and the demonstration of its power as a cure for diphtheria, provided it be administered soon enough, the early diagnosis of the disease is of vital importance, and in many cases that can only be done with the microscope. It is also a sure and safe preventive of the disease, so that upon its appearance in one of a family of children the rest

can be immediately made safe against it. Our cities and larger towns will no doubt avail themselves of the kind offer made, and another advance in the cure and prevention of one of the most justly dreaded diseases will be recorded in our State.

THE MONTHLY BULLETIN.

This publication of the Board, besides being a monthly record of the health of the people of the State and the condition of the jails and county homes, is a medium of communication with those whose active interest in sanitation it is most important to secure. It is sent as second-class matter, at a monthly cost in postage of about sixty-five cents for 1,250 copies, to health organizations, public libraries, etc., throughout the country, and in this State to all members of the North Carolina Medical Society and all other physicians who wish it; to the health officers and Mayors of cities and towns; the chairman of every Board of County Commissioners, and to every one who takes sufficient interest in sanitary matters to ask for it.

As the physicians, owing to the nature of their calling, come more closely in contact with the people in the work we have in hand and can do more than any others in impressing upon them the importance of observing the laws of hygiene, its editorial columns have been utilized particularly to secure their active co-operation in our work. The following editorials selected from the files of the past two years will give an idea of what we have tried to do in this direction:

IN RELATION TO CONTAGIOUS DISEASES IN NORTH CAROLINA.

Two weeks ago a copy of the new Act Relating to the Board of Health, ratified March 1, 1893, together with a copy of Instructions for Quarantine and Disinfection, prepared by the Secretary of the State Board of

Health in accordance with the requirement in section 9 of the act, and therefore a part of the law, was mailed to every registered physician in the State with the exception of those in three counties, from the Superior Court Clerks of which no replies have been received to letters requesting a list of the registered physicians in their counties.

Section 9 says: "Inland quarantine shall be under the control of the County Superintendent, who shall see that diseases especially dangerous to the public health, viz., small-pox, diphtheria, scarlet fever, yellow fever, typhus fever and cholera, are properly quarantined and isolated within twenty-four hours after the case is brought to his knowledge, etc."

Section 10 says: "When a householder knows that a person within his family is sick of either of the diseases enumerated in section 9 he shall immediately give notice thereof to the health officer or mayor if he resides in a city or incorporated town, otherwise to the County Superintendent of Health; and section 11 requires the attending physician to give the same notice as soon as he makes a diagnosis of one of these diseases."

To successfully carry out the law in relation to contagious diseases a cordial co-operation between the County Superintendent or local health officer, the attending physician and the householder, is necessary.

These words are penned in the hope of aiding as far as possible in bringing about this necessary co-operation by suggesting how it may be best managed practically. The County Superintendent or municipal medical health officer is responsible and he cannot evade his responsibility, and whatever may be the method used in performing this duty that fact must not be lost sight of. It is manifestly impracticable to expect a County Superintendent in a large county on an entirely inadequate salary to personally superintend the quarantining of the patients and the disinfection of the premises and articles used after death or recovery in every case of contagious disease. Our health officers *ought* to be paid enough to justify them in giving their whole time to sanitary work, some of us think, but the people of our State certainly do not yet take that view of it, and until they do we must do the best we can with what they give us. The idea has been suggested that some physicians might look upon the appearance of the Superintendent of Health in the sanitary management of their cases as an intrusion and that trouble might arise in consequence. While there could be no just ground for such a feeling if the health officer confined himself to his duties and the attending physician were as courteous as we have right to expect, still it is always best to avoid anything that might lead to unnecessary friction. To that end it seems to the Secretary of the State Board that the best plan would be this: Let the County Superintendent or municipal medical health officer obtain from all registered physicians, who are themselves members of the County Boards of Health, their promise (prefera-

bly in writing to prevent any misunderstanding afterwards) to carry out the instructions for quarantine and disinfection as required by law. When notified of the occurrence of a case of the diseases mentioned, in the practice of any one who has made this promise, let him promptly send him a copy of the instructions together with a proper placard. At the same time he should send to the householder also a copy of the instructions with a note calling attention to the requirements of the law in such cases, and stating that he had committed its execution to the attending physician who had given his promise to see it carried out. The attending physician, remembering the responsibility resting upon the conscience of the health officer, should, immediately upon the completion of the disinfection, certify to him that the requirements of the law had been met. The health officer should of course personally look into any suspicious cases having no physician, and if contagious disease be found, see himself that the required precautions are taken.

While the above is not the ideal method of applying the law, it is as good, taking all the facts as they actually exist into consideration, as any which occurs to the writer that is at all practicable.

Twenty-five placards each for diphtheria and scarlet fever, and two each for the other four diseases, together with fifty copies of the Instructions for Quarantine and Disinfection, have been sent to every County Superintendent and municipal medical health officer. Upon notification to the Secretary of further need a new supply will be forwarded. The Secretary would also be glad to furnish the same to individual physicians in counties having no Superintendent, and he hopes that immediately upon the occurrence of a case of either of the diseases mentioned in the practice of any one living in such counties notice will be sent to him at once that he may send the "Instructions" and placards.

LOCAL BOARDS OF HEALTH.

The proverb, "What is everybody's business is nobody's business," is as true in sanitation as in every other branch of human effort. Looked at from the stand-point of a man's duty to himself and to his neighbor, the observance of the laws of hygiene ought to be the particular business of every individual. But the obligation is not recognized, or, if it is, it is not met. And so it becomes necessary to provide some means to force the people, as far as possible, to perform their duty in this respect, as in so many others. This force to be effective must be handy and easily and promptly applied. In consequence, a local Board of Health whose special business it is to look after these matters is practically a necessity to effectual work in any community. In the hope of bringing about the establishment of such Boards and the observance of approved methods by them, the Secretary has sent out the following letters, which may be of

interest to our readers. They explain themselves. Copies of the ordinance, blanks, etc., will be gladly sent to any one interested enough to write for them:

"NORTH CAROLINA BOARD OF HEALTH,
"RALEIGH, June 9, 1893.

"*The Honorable Mayor and Board of*..... .....

"GENTLEMEN:—I send herewith a copy of the Act Relating to the Board of Health (Chapter 214, Laws of 1893), a model health ordinance, based chiefly on the admirable one issued by the Pennsylvania Board of Health, and various blanks, which explain themselves. I hope that you will adopt and enforce them, thereby materially advancing the cause of public health and *pari passu* the prosperity of your town. The ordinance may strike you as being rather voluminous, but a careful consideration of the same will, I think, show the reasonableness and importance of each section. Still, if deemed necessary, it can be modified to suit the particular conditions of your town, though I would be glad to have it adopted as it stands in order to secure a uniform system in every town in the State.

"In cities and towns where people are more or less crowded together and the danger of contamination of air and drinking water and the spread of communicable diseases from person to person is in consequence greatly increased, the practical application of sanitary laws is especially important. The collection of vital statistics, particularly those relating to the cause of death, should be carefully looked to in order to ascertain those most prevalent, with a view to taking special precautions against them in the future. It is also of great importance from a material point of view. One of the first inquiries made by intending immigrants is in regard to the healthfulness of their contemplated destination, and that information would be sought for at this office. To give an opinion I must be assured of their *completeness* and *accuracy*. Those two essentials cannot be obtained unless the method recommended is faithfully carried out, viz.: The positive refusal to allow the body of any one dying in the town to be buried or removed without a permit from a designated official, based upon a properly filled out and signed death certificate giving the cause of death; or some other method equally as reliable. The healthfulness of our State is one of its greatest attractions, and the only way to demonstrate it to strangers in these days of scientific accuracy is by means of reliable vital statistics. In our present stage of sanitary development these statistics can only be obtained from our cities and towns, and I trust you will help your own immediate home and, at the the same time, aid me in showing to the world our advantages in this most important item of health.

"Any further assistance in my power would be most gladly rendered by, Yours very respectfully,

"RICH'D H. LEWIS, M. D.,
"*Secretary.*

The following letter was sent to every physician in the towns referred to:

"NORTH CAROLINA BOARD OF HEALTH,

"OFFICE OF THE SECRETARY,

"RALEIGH, June 12, 1893.

"MY DEAR DOCTOR:—The State Board of Health is very anxious to have established in as many of our cities and towns as possible Local Boards of Health for the twofold purpose of more effectively preventing disease and securing reliable vital statistics. To this end I have prepared and sent to the Mayor of every town in the State of more than five hundred inhabitants and to all county-seats of less population a model ordinance in which is set forth, in addition to numerous sections relating to health preservation, the machinery necessary to the formation and operation of Local Boards; also a sample death certificate, burial certificate, birth certificate and instructions with sample blanks for sanitary inspection, which you can see at the Mayor's office.

"If you have no local Board of Health will you not confer with your professional brethren and the municipal authorities and make an earnest effort to have one established at once?

"If you already have one will you not compare the methods in use with those suggested that the best may be employed? If those suggested, particularly those relating to the collection of vital statistics, more especially the death-rate, are considered equally as good as those already in use, and it be agreeable to the authorities, I would be very glad to have the former substituted for the latter in order to the establishment of a uniform system throughout the State.

"It is superfluous, if not insulting, in this day to argue to any well-informed physician the value and importance of sanitary regulations properly enforced, and the value of reliable vital statistics, from both a scientific and a material point of view. So I assume that you are interested in the subject and hope you will lend a hand in advancing the good work. Very truly yours,

"RICH'D H. LEWIS, M. D.,

"*Secretary.*"

TYPHOID FEVER.

The presence of typhoid fever in twenty-three counties reporting for June and private advices since the 1st instant as to its outbreak in two others, and the further fact that in at least one instance it has proven unusually malignant, suggest the advisability of calling the attention of all physicians as well as of all other readers in this State to section 21 of the Act Relating to the Board of Health. It reads as follows:

"SEC. 21. Any householder in whose family there is to his knowledge a person sick of cholera or typhoid fever who shall permit the bowel discharges of such sick person to be emptied without first having disinfected them according to the instructions to be obtained from the attending physician or the County Superintendent of Health shall be guilty of a misdemeanor, and upon conviction shall be fined not less than two nor more than twenty-five dollars, or imprisoned not less than ten nor more than thirty days. And in cases where such undisinfected discharges are emptied on the water-shed of any stream or pond furnishing the source of water supply of any public institution, city or town the penalty shall be a fine of not less than twenty-five nor more than fifty dollars, or imprisonment for not more than thirty days. And any physician attending a case of cholera or typhoid fever who refuses or neglects to give the proper instructions for such disinfection as soon as the diagnosis is made shall be deemed guilty of a misdemeanor, and upon conviction shall be fined not less than ten nor more than fifty dollars."

The meaning of this section of the law is so plain that "he who runs may read."

The very great importance of its conscientious observance by all householders and physicians is self-evident to any one who at all keeps up with the times in sanitary matters. Its reasonableness cannot be disputed, for the directions for properly disinfecting these discharges are plainly given in the Instructions for Quarantine and Disinfection prepared by the Secretary in obedience to section 9 of the act and sent to every registered physician in the State except those in three counties whose names could not be obtained. The disinfectants recommended are cheap and handy, and can be thoroughly used with very little trouble.

It is to be noted that not only physicians who refuse (it is difficult to imagine a physician worthy of the name refusing upon request to give advice that will prevent the spread of a dangerous disease) but those also who *neglect* to give the proper instructions for such disinfection are guilty of a misdemeanor and subject to fine. Sanitary sins are generally sins of omission and unfortunately like such sins in other directions are extremely common. It is earnestly hoped that all physicians will show themselves no less law-abiding than other good citizens, and will do their full duty to their neighbors as their State demands of them. By so doing they would be the means of saving many lives directly and would at the same time do more to educate the people in the principles of enlightened sanitation than any other influence that could be brought to bear on them.

TYPHOID FEVER AGAIN.

Although faint mutterings of cholera to the north of us and a somewhat louder growl from yellow fever to the south of us are heard, typhoid fever is unusually prevalent within our own borders, and its prevention remains with us in North Carolina the great sanitary question of the day. When we realize that the number of deaths annually from typhoid in this State is estimated at one thousand it is easy to understand that it has slain its thousands where both the other diseases combined have claimed their tens, or less. And it will continue to do so, probably in an increasing ratio, unless our people can be aroused to the importance of the strict observance of the proper sanitary precautions. As a practical sanitary question, therefore, for the whole State, the prevention of typhoid fever is a very much more serious one than that of either of the other much more dreaded diseases. But it is extremely difficult to get the people to realize and act upon it. Such a realization on their part we regard as of so much moment that at the risk of proving tedious we bring up the subject again for the purpose of urging County Superintendents and all other physicians to bestir themselves to promote a more enlightened public sentiment on this subject especially, not omitting other matters pertaining to preventive medicine. Much to our regret and discouragement, we have been compelled to admit that many of our physicians are not as careful as they might be in impressing upon the nurses and friends of their patients the danger of spreading the disease to themselves and others by using the same drinking utensils as the patient, by continuing to use the same water supply unboiled, by washing the undisinfected soiled linen near the well, and, worst of all, by disposing of the bowel discharges, in any manner, without thorough disinfection by reliable disinfectants of the same. But even when the matter is not overlooked it often happens that the directions given are so general and vague as to be of no practical value. Again, it frequently occurs that the family having received the proper instructions fail to carry them out—sometimes not at all, but more often inadequately.

Most people are reasonable and tractable, particularly in their relations with one in whom they usually have so much confidence as their family physician. If they understand the reasons for a certain course of action, and they are good reasons, they are very apt to follow that course. The generality are entirely ignorant of sanitation, and the attending physician, therefore, should take some pains to explain to them how the fever is transmitted through the drinking water contaminated by germs from the undisinfected discharges of some previous case, clinching the matter by giving illustrations, which can easily be done from medical literature, if not from actual personal experience. A want of faith is at the bottom of the whole trouble. Convince their judgments and the proper action on their part will follow.

In conclusion, a word as to the disinfectants to be used. Those recommended in the Instructions for Quarantine and Disinfection, a copy of which has been mailed to every registered physician in the State, except those in three counties whose addresses could not be obtained, were given after very careful consideration and due consultation of the best authorities. It is advised that they only be used, as they are reliable, cheap and convenient. Beware of ready-made, patent or proprietary disinfectants; they cannot be depended upon as germ killers, though they may be very good deodorants.

SANITARY PROGRESS IN 1893.

With this issue of the *Bulletin* the edition will be increased from eight to twelve hundred copies, and it will hereafter be sent to every member of the State Medical Society as well as to every other person interested enough in it to ask for it. It is to be regretted that at present the means at the disposal of the Board of Health do not permit its being sent to every physician in the State. Although it is well known that there are many excellent men who have never, for various and doubtless good reasons, connected themselves with that organization, the fact that a physician is a member of the State Society is presumptive evidence that he is wide awake and interested in his profession. No one who really keeps abreast with medical progress can be indifferent to the claims of preventive medicine, which has made such rapid strides in late years. The Board of Health realizes that the success of the cause they have in charge depends upon the interested support of the medical profession. Without that support its most earnest efforts must prove for the most part fruitless. It is in the hope of exciting a more active interest on the part of the, generally speaking, representative medical men throughout the State that this step is taken. The strange indifference, amounting in some cases almost to actual hostility, to the claims of sanitation shown unfortunately by many of our physicians—men from whom better things might be expected—is the most discouraging obstacle we have to face. There is not in the health laws of the State a single claim made upon its medical citizens which a decent regard for humanity not only justifies but demands—as a careful perusal of the same will, we think, prove to any reasonable man. It is therefore hoped and believed that by bringing these matters frequently to their attention through the monthly visits of the *Bulletin* greater interest in the cause in general and a more loyal support of the law in particular will be excited among our leading physicians. This being accomplished, it is not unreasonable to anticipate that the influence of their example will gradually but surely bring about a similar state of affairs among their professional associates and the people at large. While all that has been written is only too true, we have,

nevertheless, made gratifying progress in the past twelve months, as a comparison of the present number of the *Bulletin* with that for November, 1892, will show. At that time out of a total of ninety-six counties only sixty-four had Superintendents of Health, of which number only forty-three reported, while this month the number of Superintendents recorded is eighty-eight, of whom *not one failed to report*. This is very encouraging. We are further encouraged by the fact that two of our principal towns, Salisbury and Oxford, have adopted the model health ordinance sent out by the Board during the summer, which, if enforced, will insure accurate and reliable vital statistics—something greatly to be desired. But we will consider this subject at length in a subsequent issue.

By the time this reaches our readers the new year will be impending. Among the good resolutions to be made on its first day there will be numbered, we trust, one on the part of every medical reader at least to do more than ever before for the noble cause of preventive medicine.

SMALL-POX.

Small-pox is, we regret to say, spreading rapidly over the United States. Winter is the season most favorable to its diffusion. The rapid and easy communication between all parts of the country renders its introduction more than likely. The immense number of unvaccinated persons in our State furnishes a most fruitful and inviting field for the work of this most dreadful disease. All our medical readers, Superintendents of Health especially, are urged to be on the alert, and to immediately and strictly quarantine every case, including those that are suspicious, vaccinating promptly not only those who may have been exposed, but every one whom the fright may have induced to seek that protection. The name and address of a reliable dealer in vaccine will be gladly furnished if desired.

DEATH OF DR. SUMMERELL.

It is with heartfelt sorrow that we record the death from double pneumonia, consequent upon an attack of the grip, of Dr. J. J. Summerell, of Salisbury, Superintendent of Health of Rowan county. On the afternoon of Sunday, the 17th inst., at the age of seventy-four, this faithful physician, sterling citizen and Christian gentleman, surrounded by his children and in possession of the respect and affection of his neighbors, after a long life of usefulness and honor, passed to his reward. The State, the medical profession, and especially the cause of sanitation in North Carolina, have suffered a serious loss. While the oldest, he was, nevertheless, one of the most active and enterprising Superintendents in the State. We shall miss him, personally as well as officially.

VACCINATION.

In a recent letter from one of the largest practitioners in the State, living in a town of over five thousand inhabitants, situated on one of the main lines of travel, this startling sentence occurs: "In making inquiries I find that there are scarcely a dozen children in the whole town who have ever been vaccinated." While we were painfully aware of the fact that the number of the unvaccinated was alarming, we had no idea the state of affairs was so bad as shown by the above. This is an extremely serious matter, as all must admit, and it is becoming more and more serious every day. In our last issue we called attention to the rapid spread of small-pox over the United States and sounded a note of warning. Since that time the disease has made its appearance in our own State—in Cherokee: but thanks to the prompt and vigorous action of the County Superintendent of Health looking to the quarantining of the patient he did not abide with us long. Rather than be quarantined he left the State, thereby demonstrating in a very practical and satisfactory manner the value to the community of an organized health department with an alert health officer. Most fortunately also he came in contact with none except those who were protected by a previous attack of the disease, and we have good reason therefore to hope that he will not leave a trail behind him. There is no reason why a similar case should not crop out at any other point in the State, particularly on the main lines of travel, which are now more than commonly infested with tramps. It is most unlikely to happen again that every one exposed is protected, and if not there is no telling, in view of the great number of unvaccinated persons to be found everywhere in the State, what a terrible scourge might then and there be originated. The danger is a real one, but how to get the people to realize it and to avail themselves of the protection so easily obtainable is the question, and a most difficult question it is to answer. Most persons not aquainted with the temper of our people would say at once make vaccination compulsory. That sounds well, but it would be *vox et preterea nihil*. In the first place, in the opinion of the writer, our Legislature could not be induced to enact such a law; and if it could the law would, unsupported by public sentiment, be a dead letter. As to what public sentiment on this subject is the following will illustrate: At the conjoint session of the State Board of Health with the State Medical Society in Wilmington in 1892 one of our County Superintendents reported that going to a public school-house to vaccinate the children, according to a previous appointment, he found the house shut up and the entire school, teacher and all, taken to the woods. Again, more recently, an outbreak of the small-pox occurred in an adjoining State about fifty or sixty miles from one of our progressive towns. The Town Commissioners discussed the advisability of passing an ordinance making vaccination compulsory, whereupon some

of the best citizens promptly gave notice that they would sell out and leave the town before they would submit to it. Comment is unnecessary.

We would like to discuss this grave matter at length, but our want of space forbids. Suffice it to say that after a very careful consideration of the subject we have come to the conclusion that nothing can practically be accomplished in the way of vaccinating the people except under the influence of the scare resulting from the presence in the community or in very close proximity thereto of a case of small-pox. It is therefore earnestly hoped that whenever such a state of affairs does happen to occur the health officers and physicians generally will grasp the situation and "work it for all it's worth."

In conclusion, we wish to call particular attention to section 11 of the law, which requires the attending physician to immediately give notice to the local authorities of the occurrence of a case of small-pox, and the latter to immediately communicate the same by mail or telegraph to the Secretary of the State Board of Health. The location of the case, the origin of the disease and the measures taken to prevent its spread should always be given in this communication.

P. S.—After the above was sent to the printer a report was received from the Superintendent of Anson county of the existence in Wadesboro of a case of varioloid in the person of a horse drover from Virginia, near Bristol. He at the same time reported that the precautions required by law had been promptly taken.

VITAL STATISTICS.

One of the most important functions of a sanitary bureau is the collection of vital statistics. Section six of our law says:

"Monthly returns of vital statistics, upon a plan to be made by the State Board of Health, or their Secretary acting under their instructions, shall be made by the County Superintendent to the Secretary of the State Board."

The plan devised by the late Secretary, the lamented Dr. Wood, and still in vogue as the best available, is not calculated to secure complete and accurate statistics, but merely a general idea of the prevalence of particular diseases, especially those of a communicable character, in the counties, and the number and causes of death in the cities and towns. Indeed, the conditions with us are such—an extremely conservative and rather sparsely settled rural population in the main—that obtaining reliable statistics from the State at large is simply out of the question at present, and we fear will be for very many years to come. And yet it is of peculiar importance to our State, inasmuch as immigration is greatly desired, that we should have accurate and reliable statistics, especially in mortuary statistics. We say accurate and reliable, for when they

lack those qualities to any appreciable extent they are worthless. The practical question is, how can they be obtained? The answer is, from the cities and towns. While such statistics would not be as valuable as those collected from the whole State, it is the best that can be done, and they would furnish excellent samples of the health conditions in the different sections of the State and an admirable basis for comparison with similar communities in other States and countries. But even in cities and towns it is no easy matter to secure full and reliable mortuary statistics. It cannot be done, in the opinion of the writer, except under the strict and vigilant enforcement of a stringent ordinance imposing a decided penalty for the burial or removal from the corporate limits of a dead body except upon a burial permit issued by a designated official, based upon a death certificate, giving, chief among other things, the cause of death, signed by the attending physician, or, in cases where there was no attending physician, by the nearest friend, and sworn to by him before a magistrate. The authorities should impress this ordinance particularly upon the undertakers in such a manner as to effectually prevent their undertaking the preparations for burial until the burial permit is produced. Something less than a year ago we sent to every town in the State having five hundred or more inhabitants, and to all county-seats of less population, a model ordinance, with sample blanks, in which the regulations suggested above were set forth, in the hope that it might be generally adopted and mortuary statistics collected in every place on the same plan. While only two towns have formally adopted the ordinance as a whole, a number have it essentially, and the statistics sent in we believe to be generally reliable. But we cannot help feeling when we note a death-rate very much smaller in one town than in another of about the same sanitary conditions that the former either has an imperfect ordinance or does not enforce a good one. We are not willing to admit, of course, that any municipality would deliberately "fudge," as we used to say in marbles, on its sisters

We have brought forward this subject because of its importance and in the hope that those of our readers living in cities and towns will interest themselves in the matter sufficiently to inquire as to the ordinance on the subject and as to the enforcement of the same. The display of such an interest on the part of the medical men of any city or town would surely have its effect upon the authorities and make for the perfecting of the returns.

MALARIA AND DRINKING WATER.

If we have a sanitary "fad" it is the influence of the drinking water in the production of malarial diseases. It has always possessed a peculiar interest for us, originated possibly by the plasmodia imbibed in

childhood from the "old oaken bucket" that hung in the shallow surface well, the remembrance of which is so dear to our heart. But our first conscious interest in the subject was brought about by hearing, many years ago, one we loved and trusted, a member of one of the two families referred to, make this statement: There were two families, composed each of father and mother and seven children, friends and next-door neighbors, in one of our eastern towns. One family drank from what was regarded with pride as "the best well in town"; the other of rain-water caught in wooden tanks. The members of the first family were constantly sick with malarial disease of one kind or another. Those of the second never had even a chill.

We have heard and read of many similar instances since, and while many writers on malaria ignore the drinking water as a channel of introduction of the malarial poison into the system, the conviction has been growing upon us that, if not the chief, it is one of the principal avenues of ingress. We desire and intend, with the assistance of those who can help us by giving us the necessary information, to demonstrate this fact upon homespun evidence. To that end we propose to send to every physician living in the malarious sections of the State the subjoined circular letter, and we earnestly hope that every one who can give us any pertinent information of his own knowledge, or send us the names of any of his acquaintances who have had experience in this matter, will do so promptly. If we succeed in making out a satisfactory case, the evidence will be laid before the people most interested in a form which will, we hope, make sufficient impression upon them to bring about some practical result of real value:

"DEAR DOCTOR:—The evidence that malarial diseases are introduced into the system, in many if not most instances through the medium of the drinking water is, to my mind, conclusive. The water containing the germs or plasmodia is surface or superficial soil water. Those living in malarial districts who confine themselves to water from cisterns or wells driven or bored beneath the stratum of marl or impervious clay—in other words, beyond the water which soaks down from the surface—are to a large extent free from attacks. If the people of our eastern counties could be generally convinced of this fact and thereby induced to act upon it, the health conditions of that really fine section would be revolutionized for the better. To bring this about is the object of the Board of Health. In order to do this facts must be presented to them in the concrete—not by illustrations from "Asia and Spasia and t'other side o' Hillsborough," so to speak, but by instances from among their own neighbors. I write to ask you if you know any facts bearing on this subject, and, if so, that you write them to me in detail at your earliest convenience. Give the name and post-office of the head of the

family having the experience. If not personally familiar with the facts send me the name and address, that I may write him direct.

"Your kind and prompt attention will greatly oblige,

"Yours truly,

"RICH'D H. LEWIS,

"*Secretary.*"

THE PREVENTION OF BLINDNESS.

In addition to the adoption of the resolutions in regard to the better education of our physicians in hygiene published in our last issue action was also taken by the conjoint session of the State Board of Health and the State Medical Society at its second annual meeting looking to the lessening of blindness, a calamity second only to death itself.

While the estimates vary we think it safe to say that *ophthalmia neonatorum* is the chief cause of hopeless blindness. Quite a number of years ago in a paper on this subject of the purulent conjunctivitis of the newborn we attempted to show in our introductory remarks that blindness from this cause as well as congenital blindness was a peculiarly sad affliction, more to be deplored than blindness coming on later in life. We cannot lay our hands upon it, but we remember the main point in our argument is this: A person who has never consciously seen or who has no recollection of seeing can never have the mental concepts that can come only through the eye; he can never conceive the idea of color, and those of form and distance must be very inadequate. This being true, it is easy to understand how seriously handicapped such a person would be in his mental operations, particularly those involving the exercise of the imagination. If, however, he has enjoyed even for a season the inestimable blessing of sight the pages of memory will have been illuminated with innumerable pictures that can never be entirely effaced; he will be in possession of accurate and complete conceptions of color, form and space, and thereby enabled to apprehend in their completeness the ideas transmitted through the language of others. Therefore, having these beautiful conceptions, he can in the kaleidoscope of the imagination evolve an infinite number of pictures and enjoy more fully the pleasures of that faculty. So if there can be degrees in such a misfortune, so dreadful at its best, we feel that the class under consideration are most to be pitied. But it requires no argument to excite the sympathy for these stricken little ones of our readers or to enlist their co-operation in any movement for saving others from the same affliction. Most of them have doubtless seen such cases, and no words can equal in eloquence the mute appeal of those sightless and disfigured orbs. The practical question with us is, What can we do to prevent in future such cases of blindness? *Ophthalmia neonatorum* itself is generally a preventable disease, but even when the disease has become established its serious

consequences can almost always be averted by prompt recognition of its presence and proper management of the treatment. All well-educated physicians are familiar with the disease, its treatment and its dangers; they therefore require no instructions on these points. It is the midwives and monthly nurses that we must reach and compel them if possible to call in a qualified physician immediately upon the appearance of redness or swelling of the eyes within the first two weeks of the life of any infant under their charge. Legislation requiring such notification under penalty for failure has been enacted by the States of New York, Maine and Rhode Island. At the meeting of the American Medical Association in 1893 a committee was appointed by the Section of Opthalmology, Dr. Lucien Howe, of Buffalo, chairman, to urge such legislation. The conjoint session adopted the following resolutions:

"*Resolved*, That it is the sense of this conjoint session of the State Board of Health and the State Medical Society that legislation tending to lessen blindness from this disease (*ophthalmia neonatorum*), similar to that already enacted in a number of the other States, is desirable.

"*Resolved*, That the Committee on Legislation of the Medical Society be requested to use their best endeavor, if in their judgment after the assembling of the Legislature in 1895 it be wise to agitate the subject, to secure the enactment of such a law."

We are not sanguine enough to believe that any law on this subject can be practically enforced in the present state of public opinion, but we believe that its presence on the statute book and distribution throughout the State will do good, will enlighten the people and save some innocent little ones from a life of hopeless darkness.

PREVENTION OF TUBERCULOSIS.

As announced in the last *Bulletin* the campaign which the Board proposes to conduct against the spread of tuberculosis in North Carolina was opened by the admirable paper of Dr. S. Westray Battle, of Asheville, read at the recent Salisbury Health Conference. It will appear in the forthcoming *North Carolina Medical Journal* and then be distributed in pamphlet form to every physician and many citizens of other callings throughout the State. That is a good big gun and we believe it will do much execution, but in such a war as this—against an enemy so numerous and so strongly entrenched—every death-dealing agency must be brought into play. The medical men can operate the artillery, but the main question is how to get the best repeating-rifles into the hands of the rank and file—the people.

The Secretary is *ex officio* the leader in this fight, but he feels that every physician is, under the principle of *noblesse oblige*, one of his brother officers. He has cogitated deeply on the subject of how to prac-

tically reach the people, and while he has several schemes in mind he remains of the same opinion he has long entertained—that it is through the family physician it can best be done. But how to enlist the family physician? That is the question. As mentioned before in these columns the most disheartening fact which confronts the Board in its work for humanity is the coldness and indifference of so many physicians of whom better things could justly be expected. If our natural allies do not stand by us what are we to do? But we feel a special interest in this matter other than that of the health officer. Our pride in our North Carolina profession is involved. For many years, as is probably known to most of our readers, we have earnestly endeavored by voice and pen and whatever personal influence we might have with members of the Legislature to promote the elevation and advancement of the profession by raising the standard of medical education. While our people generally are sometimes referred to by outsiders as "slow" we have rejoiced at the meetings of our State Society to hear distinguished medical visitors from other States and the largest cities say that it was equal to the best and superior to most similar organizations known to them. It may be that, like the crow that thought his nestling the whitest, we exaggerate the importance of hygiene, but we believe that every thinking physician who reads will admit that it is the coming branch of medicine. We would be mortified if our men were "not in the swim." Gentlemen, we must "keep up with the procession."

What we desire of the family physician is that he explain not only to his phthisical patients, but to the uninfected of his *clientele* as well, the communicability of the disease and the way to prevent its spread. He is doubtless already well informed on this subject himself, but we would be only too glad to forward matter for distribution among his patients. We would be particularly glad to have him report directly to this office every case of tuberculosis as soon as the diagnosis is made that we may forward the proper instructions and thereby save him trouble. In some States this is now obligatory. While voluntary with us we hope that this duty will be none the less thoroughly performed.

Think of four thousand persons dying in our State every year of consumption; lay that fact to heart and lend a willing hand in the effort to check such slaughter.

HYGIENE AND THE MEDICAL COLLEGES.

REMARKS BY THE SECRETARY AT THE RECENT MEETING IN WASHINGTON OF THE NATIONAL CONFERENCE OF STATE BOARDS OF HEALTH.

Mr. President and Gentlemen:

When I received notice from the Secretary of this body that I had been appointed to open the discussion on the question, "Should medical colleges be required to devote an adequate time to instruction in

hygiene, and exact of candidates for the degree of Doctor of Medicine an examination in this branch of medical education?", I was sincerely surprised. At the same time as a patriotic North Carolinian I was gratified at the reason assigned for the selection of so humble an instrument, to-wit, that our State was a pioneer in such matters. I must, however, disclaim any particular credit for North Carolina so far as making any special effort for better education in hygiene is concerned. If I am rightly informed, to Illinois, in the person of our late friend and associate, Dr. Rauch, that honor chiefly belongs. But I am constrained to confess that we are proud of the fact, which is well known, that in the matter of elevating the standard of general medical education, by the enactment of a practicable license law, North Carolina was *the* pioneer, and that she continues to march in the front rank.

The subject before us, Mr. President, is, by odds, the most important on the programme. Every other question proposed represents some particular part of the superstructure of hygiene, while this is the very bed-rock upon which applied sanitation rests—and theoretical or unapplied sanitation is of no practical value. The fact is, gentlemen, that the answer to this question is so plain and so irresistibly self-evident that I feel embarrassed lest in arguing in its support I insult your intelligence. You will, therefore, please pardon me if I appear to be elementary.

It is a well-established fact, which no man of experience will deny, that no law, unless supported by public opinion, can be enforced—certainly in this free country of ours. The opinions of the people on any subject are controlled by the attitude of trusted leaders in whose knowledge of that subject they believe. No class of men have the confidence of the masses of the people, in matters generally, but especially in all relating to medicine, to the same degree as the family physicians of our land. Disease being a departure from health, the proper study of disease implies a study of the laws of health. Every man of common sense assumes that his physician is familiar with these laws. If he hears nothing of them from him he takes it for granted that they are of no special importance and, consequently, instruction from others of as little, or less, authority in his opinion makes no impression. It is through the medical adviser, therefore, chiefly, that a public opinion in support of the practical application and enforcement of the laws of hygiene must be built up. But it is a lamentable fact that the attitude of the profession generally to this most important subject is one of cold indifference. Indeed, I am informed that it sometimes happens in individual cases—rare let us hope for the honor of our profession—that the physician, in order to conciliate a paying patron, will actually countenance a deliberate violation of the plainest rules for the prevention of the spread of contagious diseases—and for no better reason than that his

client is not willing to be put to a little temporary inconvenience for the sake of the health, and lives often, of his neighbors.

Now, what is the explanation of this state of affairs? In my humble judgment it is attributable, mainly, to a want of proper instruction during the formative period in their medical lives. "Train up a child in the way he should go and when he is old he will not depart from it" is a proverb of the wisest of men which applies with equal force to the education of physicians. The neglect of this early training is, doubtless, the chief cause of the indifference to the claims of sanitary science of which we complain in so many physicians now in the field.

If hygiene be given a dignified position in the curriculum and its great importance be properly emphasized, there can be no question as to the good it would accomplish in the coming generation. It would not only redound greatly to the welfare of the people, but it would have an elevating effect upon the profession itself, by impressing the philanthropic aspect of the calling which we are in the habit of referring to as "noble"—improperly, we must admit, if we take the merely commercial view of it—if we value it simply for the money there is in it.

I regret that I am not informed as to the extent to which hygiene is taught in all our medical colleges, but from what I know I feel that I am safe in saying that, outside of a very few of the best, the subject is practically ignored. That this condition of affairs should not be allowed to continue, if it can be prevented, needs no further argument. As guardians of the public health it is our duty to see that it is done. We have it in our power to do it. In many of the States the State Board of Health and the Medical Examining Board are one and the same. If those Boards alone will unite in demanding of the medical colleges sufficient instruction in hygiene, and will *require of every applicant for license satisfactory evidence that he has received and profited by it*, the matter will be settled. Of course the desired result would be obtained more quickly and more certainly by an advance all along the line. In those States where the two Boards referred to are separate and independent of one another the Board of Health should exert itself to interest the Board of Examiners, particularly, and the profession, generally, in the subject. As bearing upon this point, and as a fitting conclusion to what I have to say, I will take the liberty of quoting, what some of you may have seen, an editorial entitled "Hygiene in Medical Education," which appeared in the June number of our *Bulletin* and which shows what action has been taken in North Carolina. The reader is respectfully referred to the same.

HYGIENE IN MEDICAL EDUCATION.

At the recent conjoint session of the State Board of Health and the State Medical Society the following resolutions were unanimously adopted:

"*Resolved*, That the medical colleges of the country be requested to give to the subject of hygiene sufficient time for thorough instruction of their students on that subject—not less than two lectures a week.*

"*Resolved further*, That our Board of Medical Examiners are hereby requested to require of applicants for license the same preparation on this as on the other branches of medicine named in the Medical Practice Act."

Resolutions similar to these were adopted not long since by the State Board of Health of Ohio, and perhaps other Boards of Health have done the same thing, but so far as we know this is the first instance in which the organized medical profession of a State has joined in such action. It is significant of the progressive spirit that animates the profession in North Carolina. The importance of having the medical colleges pay more attention to hygiene than most of them do is apparent. Every physician who does his whole duty is necessarily a health officer. His noble mission is to save from sickness and death. In no way can he accomplish so much as by the inculcation and moral enforcement of true sanitary principles. No matter how well organized a health department may be, nor how competent the legal health officer, satisfactory results in preventive medicine cannot be obtained without the cordial co-operation of the attending physician. If this is true, and we do not suppose any one will controvert it, the fact is a lamentable one that so many of us manifest such a degree of indifference to practical hygiene. As we have remarked in a former number of the *Bulletin*, this fact is inexplicable to us, or has been; but we think we see light. "As the twig is bent the tree's inclined." In our medical childhood, while under tutors and governors, we were not sufficiently instructed in hygiene, our minds were not inclined in that direction. This most important subject was, in the medical education of many of us, entirely ignored or belittled by the meagre attention it received. And we believe this is the principal reason that so many physicians admirably equipped in every other respect are so strangely indifferent to the claims of sanitation.

If our Board of Medical Examiners accedes to the request made in the second resolution (and we believe it will for the reason that it is composed of men who represent the progressive element in the Society), we shall feel hopeful of a goodly yield of fruit from the first resolution.

None of our readers not thoroughly familiar with matters medical in North Carolina can fully appreciate what a power the Board of Medical Examiners has been and is in promoting higher medical education. It has, with its absolute independence under our admirable law, and its high standard of 80 per cent., with the help particularly of the Virginia Board since its establishment, to express it baldly, forced the colleges

*While not so stated, we feel sure that two lectures during the last year of the course would meet the requirements.

chiefly patronized by North Carolina students to do better work. We know that some years before the Virginia license law was passed one of these institutions informed its students from North Carolina that they would have to stand a more rigid examination than the other members of the class because of the State examination that awaited them. If our Board and those of other States join in this movement it will not be many years before preventive medicine will be better taught in our medical colleges, and our physicians, having a more thorough knowledge of the subject and a clearer idea of its importance, will give it in their daily practice the attention it certainly deserves.

REPORT OF TREASURER FOR TWO YEARS ENDING DECEMBER 31, 1894.

1893.		EXPENDITURES.	
Jan.	4.	One copy Laws of Public Health and Safety	$ 5 25
	5.	Postage on December *Bulletin*, third-class, 8 cents per pound	2 24
	6.	Stamps	10 00
	14.	Repairs to typewriter	2 50
	20.	Sundry telegrams	1 63
	25.	Stenographer for Health Conference at Raleigh	22 50
	28.	Paid for extra typewriting	3 50
	28.	J. A. Hodges, *per diem* and expenses Health Conference at Raleigh on 24th inst.	16 25
Feb.	1.	F. P. Venable, *per diem* and expenses Health Conference	20 60
	2.	Salary of Secretary for January	100 00
	2.	Cyclostyle supplies	1 90
	3.	Stamps	10 00
	4.	Express on cyclostyle supplies	40
	11.	Subscription to eight copies *Sanitarian* for members of Board	28 00
	25.	One bottle cyclostyle ink	1 00
		Telegram	25
		Express on publications of Board to World's Fair	65
March	1.	Salary of Secretary for February	100 00
	4.	J. H. Tucker, *per diem* and expenses Health Conference	11 45
	10.	Postage on *Bulletin*	2 40
		Stamps for mailing Biennial Reports	10 00
	13.	Stamps for mailing Biennial Reports	5 00
		Stamps for general purposes	10 00
	20.	H. B. Baker, Treasurer, assessment by National Conference State Boards of Health for inspection of quarantine stations on Atlantic Seaboard	30 00
April	3.	Salary of Secretary for March	83 33
		One typewriter cabinet	12 75
	14.	G. G. Thomas, *per diem* and expenses January Health Conference	14 30
	15.	R. H. Lewis, expenses Conference of State Boards of Health at New York, beginning April 5th	56 90
	17.	H. T. Bahnson, expenses to above Conference	61 70

April	29.	H. T. Bahnson, *per diem* and expenses visit to D. & D. School at Morganton at request of Chairman of Board of Directors for advice on water supply	17 15
May	1.	Salary of Secretary for April	83 33
	2.	Stamps, mailing a copy of health law and of quarantine and disinfection instructions to every registered physician	15 00
	10.	Freight on typewriter cabinet	1 52
	15.	F. P. Venable, *per diem* and expenses annual meeting at Raleigh	18 75
		H. T. Bahnson, *per diem* and expenses annual meeting at Raleigh	25 30
		J. C. Chase, *per diem* and expenses annual meeting at Raleigh	23 70
	20.	Postage, 16 packages instructions and placards to Superintendents of Health	2 88
		Express, 50 packages instructions and placards to Superintendents of Health	7 50
	22.	Raleigh Stationery Co., letter-scales	5 00
		500 postal cards	5 00
	29.	S. W. Battle, *per diem* and expenses annual meeting	12 50
		J. A. Hodges, *per diem* and expenses annual meeting	33 05
June	2.	Salary of Secretary for May	83 34
	12.	Postage on *Bulletin* three months	6 96
		Postage circular-letter, model ordinance, etc., to Mayors	5 00
	15.	Postage circular-letter to physicians, urging establishment of local boards	10 00
		Freight on typewriter	30
	17.	J. H. Weathers, difference in typewriter exchange	60 00
July	3.	W. H. Harrell, *per diem* and expenses annual meeting	29 50
		Office-rent January 1st to July 1st	30 00
		Salary of Secretary for June	83 33
	14.	Telegrams in regard to report of cholera in Northampton county	2 15
Aug.	1.	A. Williams & Co., rubber bands, 25 cents; ink, 40 cents	65
	10.	W. H. Harrell, *per diem* and expenses, investigation of epidemic of typhoid fever at Core Creek	30 80
	12.	Stamps, notice to physicians of biennial meeting of County Boards of Health	15 00

Aug.	14.	Postal cards, notice to lay members of same	3 90
	17.	Salary of Secretary for July	83 33
		R. H. Lewis, expenses investigation of epidemic of typhoid fever at Tarboro	7 30
Sept.	1.	Salary of Secretary for August	83 34
	19.	Express, 20 packages supplies to new County Superintendents	3 75
	20.	Postage on other packages	3 64
		Stamps	5 00
		G. G. Thomas, repayment of money advanced for telegrams to Dr. W. H. G. Lucas in regard to reported case of yellow fever in Bladen county,	6 54
	30.	Other telegrams in connection with same case	3 84
		R. H. Lewis, expenses to Pan-American Medical Congress	43 05
		Express on supplies to two County Superintendents,	50
		Salary of Secretary for September	83 33
Oct.	28.	R. H. Lewis, expenses International Congress of Public Health	67 75
Nov.	3.	Salary of Secretary for October	83 33
		K. P. Battle, Jr., money advanced for telegrams during absence of the Secretary	1 60
	9	J. C. Chase, expenses International Congress of Public Health	65 90
	10.	Postage—supplies to County Superintendents	94
Dec.	5.	500 postal cards for notices to delinquent Superintendents	5 00
	16.	Salary of Secretary for November	83 34
	30.	Postage on *Bulletin*—7 months, June to December, inclusive	28 56
		H. B. Baker, Treasurer, annual dues for 1893 to National Conference State Boards of Health	10 00
		Office-rent July 1st to December 31st	30 00
		Salary of Secretary for December	83 33
1894.			
Jan.	12.	Express on supplies to three County Superintendents	95
	20.	Subscription to nine copies of *Sanitarian* for members of Board	31 50
	23.	Express on supplies to a County Superintendent	50
		1 bottle mucilage	15
		Telegram to Boston for vaccine	62
		A. A. Reed, 100 vaccine points	7 00
		Telegrams in regard to reported case of varioloid at Wadesboro	1 69

Jan.	24.	Postal cards for interstate notification of contagious diseases	$ 3 00
Feb.	2.	Postage on January *Bulletin*	5 60
		Salary of Secretary for January	83 33
	10.	Express on supplies to two County Superintendents.	85
	13.	Raleigh Stationery Co., 1 stylographic pen	1 25
	16.	G. G. Thomas, *per diem* and expenses, investigation of Goldsboro water supply	9 50
March	2.	Postage on February *Bulletin*	5 84
		Salary of Secretary for February	83 34
	15.	Express on supplies to County Superintendent	45
		Express on Pennsylvania Health Reports for 1892 and 1893 to members of Board	2 25
	22.	Express on sterilized bottle from Washington	35
	23.	Express on sample of drinking water to Washington.	45
	27.	Stamps	10 00
	28.	Postage on March *Bulletin* (in separate wrappers with one cent stamp on each in compliance with orders from the post-office department,	12 65
April	2.	Salary of Secretary for March	83 33
	6.	Office-rent, first quarter	15 00
	10.	Subscription to eight copies *Doctor of Hygiene* for members of Board	4 00
	25.	Postage on April *Bulletin*	11 75
May	2.	Stamps	6 50
	3.	Salary of Secretary for April	83 33
	14.	J. T. Morris & Co., one set pigeon-holes	4 00
	24.	F. P. Venable, *per diem* and expenses annual meeting at Greensboro	19 50
June	1.	Postage on May *Bulletin*	11 70
	2.	Salary of Secretary for May	83 34
	4.	W. H. Harrell, *per diem* and expenses annual meeting at Greensboro	34 00
	14.	J. C. Chase, *per diem* and expenses annual meeting at Greensboro	25 80
		H. T. Bahnson, *per diem* and expenses annual meeting at Greensboro	13 90
	28.	Postage on June *Bulletin*	11 75
	30.	R. H. Lewis, annual meeting at Greensboro	9 05
		R. H. Lewis, expenses, trip to Goldsboro at request of Superintendent of Health	6 60
July	5.	Office-rent, second quarter	15 00
		Salary of Secretary for June	83 33
	7.	Express on sterilized bottles from, and samples of water to, Washington	95

July	14.	Freight and cartage on books for Secretary's office, $	47
	24.	Thomas Whittaker, books of reference for Secretary's office	55 05
	26.	Postage on July *Bulletin*	11 80
		Stamps	5 00
Aug.	1.	Salary of Secretary for July	83 33
	10.	Parke's Practical Hygiene	4 50
		Thomas Whittaker, works on hygiene for members of Board, including express charges on same,	113 97
	15.	Fee of Notary Public, application to enter *Bulletin* as second-class matter under recent act of Congress	50
	22.	Stamps	10 00
	28.	Postage on August *Bulletin*, second class	66
Sept.	1.	Overdue postage on Alabama Report	17
		Salary of Secretary for August	83 34
	12.	One combined desk and book-case for Secretary's office	6 50
	18.	H. T. Bahnson, *per diem* and expenses meeting at Salisbury	19 00
	21.	Express on supplies to two County Superintendents,	60
	22.	Stenographer, Salisbury Health Conference	15 00
		R. H. Lewis, expenses Salisbury Health Conference	10 40
Oct.	1.	Salary of Secretary for September	83 33
		Office-rent third quarter	15 00
	5.	Postage on September *Bulletin*	67
	8.	H. T. Bahnson, expenses American Public Health Association meeting at Montreal	73 95
	10.	J. I. Johnson, oil of peppermint for testing plumbing of D. & D. School at Morganton	6 50
		R. H. Lewis, expenses American Public Health Association	73 65
	20.	200 postal cards	2 00
	30.	S. W. Battle, *per diem* and expenses annual meeting at Greensboro and Salisbury Health Conference	55 60
Nov.	1.	Freight on bell-glass for microscope	83
	3.	Unpaid annual dues to National Conference of State Boards of Health for 1892	10 00
	5.	One bell-glass for microscope	3 00
	7.	Postage on October *Bulletin*	64
	8.	Raleigh Stationery Co., rubber type, holder, pad and carbon paper	4 20

Nov.	10.	Salary of Secretary for October	$	83 33
	18.	R. H. Lewis, expenses inspection of D. & D. School at Morganton		17 65
	28.	Overdue postage on various publications		1 35
Dec.	1.	Salary of Secretary for November		83 34
	4.	Western Union Telegraph Co., sundry telegrams		1 71
	5.	Postage on November *Bulletin*		67
	6.	Extra typewriting		4 50
		G. G. Thomas, *per diem* and expenses Salisbury Health Conference		25 90
	19.	G. G. Thomas, expenses National Conference State Boards of Health at Washington, December 12th and 13th		38 40
	28.	Subscription to *Engineering Record* for Engineer of the Board		10 00
		John Whitehead, *per diem* Salisbury Health Conference		4 00
	29.	R. H. Lewis, expenses National Conference State Board of Health		36 30
		Subscription to eight copies *Sanitarian* for 1895 for members of the Board		28 00
		Thomas Whittaker, reference books for Secretary's office		20 83
		J. C. Chase, Engineer of the Board, *per diem* and expenses, sanitary inspection of public institutions and water supply and sewerage systems of cities and towns, as follows:		
		Asheville	$18 30	
		Charlotte	11 30	
		Chapel Hill, University	7 50	
		Concord	7 25	
		Convict camps at Castle Hayne and on the Roanoke river	22 80	
		Durham	8 40	
		Elizabeth City	12 50	
		Fayetteville	10 30	
		Goldsboro and Eastern Hospital for Insane	10 90	
		Greensboro and Normal and Industrial School and A. & M. College for the Colored Race	17 30	
		Henderson	9 05	
		Newbern	11 15	
		Morganton State Hospital and D. & D. School,	7 60	

Dec.	29.	Raleigh and Insane Asylum, Institutions for the Deaf, Dumb and Blind, A. and M. College, and Penitentiary	$834 84	
		Reidsville	7 45	
		Statesville	10 52	
		Salisbury	8 35	
		Tarboro	8 22	
		Washington	13 80	
		Wilson	9 25	
		Winston and Salem	7 90	
		Time lost in travel and expenses during same,	19 35	
		Time preparing report, two days	8 00	
				$ 282 03
	31.	Office-rent, fourth quarter		15 00
		Salary of Secretary for December		83 33
		Balance on hand		265 46
				$4,555 04

RECEIPTS.

Amount on hand January 1, 1893	$ 530 29	
From subscriptions to *Bulletin*	21 75	
From sale of vaccine	3 00	
Appropriation for year 1893	2,000 00	
Appropriation for year 1894	2,000 00	
		$4,555 04

APPENDIX.

THE SALISBURY HEALTH CONFERENCE.

As constituting an important item of the Board's work, we append the proceedings, including the papers read, at a health conference *with the people* held at Salisbury on September 13, 1894. The following editorials will explain the reasons for it and give a short résumé, from which the reader can at a glance learn its scope and character:

MEETING OF THE STATE BOARD OF HEALTH.

At the regular annual meeting of the Board with the State Medical Society at Greensboro in May last it was decided to hold three meetings each year at different points in the State chiefly for the purpose of stirring up interest on the part of the people in sanitary matters. The first of these extra meetings will take place at Salisbury on Thursday, the 13th proximo. We go to press too early to publish the programme, but several papers are promised and we are sanguine of having an interesting and profitable meeting. As its prime object is to spread among the people a knowledge of hygiene and to enkindle interest in the practical enforcement of the laws of health, it goes without saying that the general public will be invited, not only to attend but to participate in the discussions. Indeed, it is hoped that it will develop into a general sanitary conference between the Board and the citizens, many of whom we trust will be present.

This question of reaching the people and sufficiently impressing them with the importance and value of the laws of hygiene to bring about their practical observance is the vital point in sanitary administration with us here in North Carolina, and we suppose elsewhere. As we have said more than once before in these columns, no law can be carried out that is not supported by public opinion, and we are striving to build up such a public opinion in favor of the most beneficent of all laws—those of health—without which happiness is impossible and life and liberty are hardly worth having. The almost invincible indifference of the masses of the people is most discouraging. Not long since in a conversation with a very intelligent physician of large experience and accurate observation on the necessity for the people of a certain settlement

scourged with typhoid fever, whose water supply had been shown by bacteriological examination to be infected with the bacteria of the human intestine, to boil their drinking water, he remarked, "They would rather die than to boil their water," and we were forced to admit that he was probably right. While it is not flattering to our vanity to be compared with the peasants of Russia, we could not help being struck with the following, appearing in a letter from our Minister to that country to the Secretary of State on "The Cholera in St. Petersburg," printed in the last issue of the *Abstract of Sanitary Reports* published by the M. H. Service: Says Minister White: "A common remark among them (the Moujiks or peasants) when they are advised to use boiled water is that if Almighty God intended them to use boiled water the rivers and lakes would have been filled with water of that sort." But we are not without hope. Besides the fact of a slow but decided increase of interest in sanitation that has undoubtedly been going on since the establishment of our Board, steadily growing in volume and activity, we are encouraged by a collateral fact, viz., the growth among our people of a sentiment favorable to better county roads. A good many years ago it became our duty as a citizen to try to do something for the betterment of the roads leading into our city. We failed utterly in our first attempt—public opinion was against us. But to-day macadamized roads running out in every direction is a hard, stony fact, and road meetings are the order of the day in various localities. It has been said that "everything comes to him who waits"—and works—and reasoning by analogy we take heart and hope to see the day when the observance of the more important sanitary laws will be a matter of course. But we are anxious to hasten that day as much as possible, and any suggestions from our readers as to the best way to really impress the masses of the people would be gratefully received.

HEALTH CONFERENCE AT SALISBURY.

The meeting of the State Board of Health with the people, to which reference was made in last month's *Bulletin*, took place as advertised on the 13th instant. It was a great success. Nothing has occurred in our experience as a health officer so full of encouragement. The discouragements in sanitary work have been so great and so depressing that we can but rejoice at this evidence of a brighter day. It was like a cool breeze on a hot, sultry summer's afternoon; it has refreshed us and toned us up, it has filled us with the ozone of enthusiasm. It proved to us that the people could be brought out and that they would respond to proper efforts to interest and instruct them in the most important of all subjects.

The Board was peculiarly fortunate in this instance in having such a man as Dr. John Whitehead to take charge of the preliminary arrange-

ments for the meeting. Being County Superintendent of Health for Rowan county as well as a member of the State Board, and possessing the respect and esteem of his professional brethren as well as the confidence and affection of the community, he was in a position to make his earnest and energetic efforts tell. He enlisted the interested support of his professional brethren of the town and county, the Mayor and other officials of the municipality, and a goodly number of the people, and this in the face of a reunion of the veterans of the county and an exciting political convention which took away many of the leading citizens.

Speaking for the Board of Health, we wish to put on record our appreciation of the cordial reception and interested attention given us by the profession and the people of Salisbury and Rowan county.

The following programme was sent in quantities to the Superintendents of all counties within easy reach of Salisbury in advance for publication in the papers and distribution through the mails. The attendance from beyond the limits of the county was, however, we regret to say, small. The presence of those who did come was, therefore, the more highly appreciated:

HEALTH CONFERENCE AT SALISBURY, N. C., THURSDAY, SEPTEMBER 13, 1894.

AIMS AND OBJECTS

The Conference is to be between the State Board of Health and health officers, both county and town, mayors and other municipal officials, and citizens generally who take sufficient interest in hygiene to attend. It is intended to be a meeting of the members of the Board with the people. Its object is to interest the people in sanitation by explaining and impressing upon them the great importance to the individual and to the community of a strict observance of the laws of health. As "the hand that rocks the cradle rules the world" the ladies are especially invited to attend. Every one present will be entitled to all the privileges of the floor and it is earnestly hoped that the discussions will be general.

Papers are promised on the following subjects:

The Sanitary Improvements of our Jails and County Homes.

The Prevention of Tuberculosis (Consumption) as We Know It To-day.

Quarantine and Disinfection in Relation to Contagious Diseases.

The Pollution of Drinking Water and Its Detection.

Drinking Water in Relation to Malarial Diseases.

An Instructive Epidemic of Typhoid Fever.

There will probably be one or two more papers of both interest and value.

Among other subjects to be discussed will be:

The Water Supply of Salisbury.

The Disposal of Waste and Excreta in Salisbury and Similar Towns.

In addition there will be a Question-Box, and members of the Board will take pleasure in answering to the best of their ability any questions bearing on hygiene.

You are cordially invited to come and bring your friends.

The meetings will be held at the Town Hall at 10 A. M., 3 P. M. and 8 P. M.

Best hotel, $2 a day.

Special railroad rates applied for. Inquire of ticket agent.

For further information, address Dr. John Whitehead, Salisbury, or

RICH'D H. LEWIS, M. D., *Secretary*,
RALEIGH, N. C.

The Board, in order to make the meeting as popular in character as possible, desired to have some prominent citizen preside, but we could not induce one to assume the responsibility. So the first or morning session was called to order by Dr. H. T. Bahnson, President of the Board of Health. The members of the Board and visiting citizens were cordially welcomed in appropriate words by the Rev. Dr. Murdoch, who, we think, if such an expression can with propriety be applied to one of his cloth, deserves the title "the near wheel-horse of the town of Salisbury," so active and successful has he been in advancing the interests of that goodly burg materially as well as spiritually. At the request of the President the Secretary explained the object of the meeting, essentially as set forth in the programme above.

The business proper of the session was begun by the reading of a paper entitled "The Prevention of Tuberculosis as We Know It To-Day," by Dr. S. Westray Battle, of Asheville. The idea that consumption was catching and that the disease could be prevented was a novel one to most of the audience, and this admirable paper, with verbal amplifications and explanations, was heard with much interest and elicited many inquiries after it was finished. It was the first gun in the campaign against tuberculosis by the Board. It was ordered to be published in pamphlet form for general distribution.

Following this was an excellent paper by Dr. George Gillett Thomas, of Wilmington, on the most important of all sanitary subjects, the very key-stone of preventive medicine: "Quarantine and Disinfection in Contagious Diseases." The questions elicited by Dr. Thomas's paper having been answered, the meeting, after a three hours' session, adjourned for dinner.

At the afternoon session a paper by the Secretary on "Drinking Water in Relation to Malarial Diseases," and one very instructive one on "Household Water Supply," sent by Mr. J. C. Chase, who was unavoidably absent, were read and discussed.

At night Dr. Albert R. Wilson, of Greensboro, County Superintendent of Guilford, read a very interesting and instructive communication on the

"Importance of Disinfecting the Dejections in Typhoid Fever," proving it by a lucid account of a recent endemic in his own county which, while small in extent, fortunately, was so plain as to cause and effect as to be practically self-evident. Dr. Wilson's paper was "the very thing" and added materially to the success of the meeting. "The Water Supply of Salisbury," which was next in order, was discussed, but not by the people of the town to the extent that we were led to expect. Upon its completion the Health Conference adjourned *sine die*.

Notwithstanding the fact that the day selected was unfortunate on account of other unanticipated conflicting meetings—that four members of the Board could not attend, and that we were deprived unavoidably of two papers on important and interesting subjects: "Sanitary Improvement of our Jails and County Homes," by Dr. Bahnson, and "Pollution of Drinking Water and its Detection," by Professor Venable, which had been prepared—the Conference was an unequivocal success. The large attendance, especially of ladies, from the beginning and increasing as the meeting progressed, and the active and lively interest shown prove it. We were assured more than once that we had sown good seed—had set the people to thinking, and had done much good. Such an assurance strengthens the Board for renewed efforts on the same line.

REPORT OF THE PROCEEDINGS OF THE "HEALTH CONFERENCE," HELD IN THE CITY OF SALISBURY, THURSDAY, SEPTEMBER 13, 1894.

The meeting was called to order by the President of the Board of Health, Dr. Bahnson, of Salem, at 9:30 A. M. Other members of the Board present, Drs. S. W. Battle, G. G. Thomas, John Whitehead and Richard H. Lewis.

Rev. Dr. Murdoch, of Salisbury, arose and welcomed the visitors in the following words: "Mr. President, ladies and gentlemen, I rise in behalf of the citizens of Salisbury to welcome these gentlemen to our city. They intend to hold conferences in the various cities and towns of our State for the purpose of endeavoring to arouse a greater interest in sanitary matters. There is no town that ought to give them a more hearty welcome than our own. Twenty years ago the health of this town was greatly injured by the

proximity of a large pond, and under the influence of the medical profession this pond was drained. Since that time there has been a vast improvement in the health of the town, and the number of deaths in the last five years has been less than half of what it was. Inasmuch as the medical profession tells us that we may expect as great or greater benefits in the time to come, if we use the proper methods, we ought to extend to the Board a hearty welcome; and therefore, on the part of the citizens of this town, I wish to extend to these gentlemen, gentlemen who are known to us by name and fame, a most cordial welcome, and to wish them Godspeed in their work."

Dr. Richard H. Lewis, of Raleigh, arose and said: "Ladies and gentlemen, I desire to say to you that the understanding was that our distinguished President was to explain the object of this meeting, but owing to his extreme bashfulness he desires me to do so, and I of course have to obey orders."

Dr. Lewis then read the programme for the day, and continued: "Now, ladies and gentlemen, the object of the Board in having this meeting with the people is for the purpose of bringing to their attention some most important facts. We are all aware of the fact that no law can be enforced unless it is supported by public opinion. The object of these meetings is to build up a public sentiment in support of the health laws, the value of which has been shown time and time again. You would be perfectly astounded, and you would be perfectly horrified, if you realized the criminal (I say criminal unhesitatingly) negligence of some people in the matter of exposing their neighbors to various contagious diseases. It is the most difficult thing in the world to persuade people who have scarlet fever, for instance, in the family to have a placard put on their door, although the law declares expressly it shall be

done. It will make them conspicuous, they say; it will produce the impression upon the community that they have a pest in the house, and they would be shunned by their neighbors. Now to illustrate: There was a case of scarlet fever in Raleigh, and the doctor told the mother of the child that had the fever that she must not let her children associate with other children, and by no means to let them go to school. She said it was not scarlet fever, and that she would not keep her children from school. He knew his woman, and so he went to the principal of the school and told him that scarlet fever was in the family, and not to admit any of the other children. But notwithstanding the fact that he had expressly forbidden these children going to school, they went the next morning, and if he had not taken the precaution to warn the principal they would have spread the disease broadcast over the town. Still she insisted that it was not scarlet fever, and went so far as to permit her neighbor's children to visit her children. The result was that two of them became sick, and one of them died. It was, not considering the motive, nothing in the world but homicide. That is a harsh word, but it was nothing less, and yet this woman was warned of the danger of letting her children associate with other children. Now I was talking to this same doctor about an epidemic that we have had down in one of our neighboring villages—about typhoid fever. I remarked that the people ought to boil their water if they insisted upon drinking the same well water. He agreed with me, but added that they would rather die than boil their water. And there are a great many people who would die before they would boil their drinking water. It is lack of faith; it is a want of faith, and what we are trying to do, ladies and gentlemen, is to increase your faith in the efficacy of these measures that have been enacted by the State entirely and

only for the good of the people. There is nothing in the world that the Board of Health will make out of it, our only object being to improve the health of the people; and all we ask is that you assist us in this work, and that you obey the health regulations that have already been provided; and I believe that in the course of time you will find a still greater change for the better than there has been in the past. We hope that every one in the audience will take part in these meetings, and if you have any questions that you would like to ask we would be glad to have you do so, and to answer them to the best of our ability."

The President introduced Dr. S. Westray Battle, of Asheville, who read an interesting and instructive paper on the Prevention of Tuberculosis, which was well received. Dr. Battle arose and said: "Ladies and Gentlemen, in making these remarks upon tuberculosis, or consumption, we have come to a subject that interests us all; and in calling the attention of this Board and yourselves to the consideration of the means to prevent this tuberculosis—you can bear in mind, ladies and gentlemen, that when I say tuberculosis I mean consumption in the broad sense of the word—I wish to preface my remarks by disclaiming any motive except a conservative one."

SUGGESTIONS ON THE PREVENTION OF TUBERCULOSIS AS WE KNOW IT TO-DAY.

BY S. WESTRAY BATTLE, M. D., OF ASHEVILLE, N. C., MEMBER OF THE NORTH CAROLINA BOARD OF HEALTH.

MR. CHAIRMAN:—In calling the attention of this Board to the consideration of measures to prevent the spread of the hydra-headed monster, tuberculosis, I wish to preface my remarks by disclaiming any intention of being other than conservative. It is so easy to become an alarmist, and when backed up by bald facts and figures, such as the history of tuberculosis offers, he must be phlegmatic indeed who is not stirred to his inmost soul by the contemplation of the ravages of consumption.

The brief remarks I shall make will simply be intended to open the discussion on the subject now agitating the world. So, then, Mr. Chairman, I want to know what we are going to do about the greatest scourge the human race has ever known? What are we going to do about a disease which annually carries off 7,0 0,000 people, and, coming closer home, strikes down 150,0 0 inhabitants of the United States, and, closer still, causes the death of not less than 4,0 0 people in the State of North Carolina? Think of it, within our sparsely settled borders ten deaths occur *per diem* from this dire malady, and yet we complacently move on, scarcely giving it a thought. It is simply consumption—we are used to that. It is part and parcel of our existence, we say. Still, let yellow fever or cholera threaten our borders, and town, county, State and Federal Government are up in arms and ready to spend any amount of money; yet this epidemic is nothing compared to the great epidemic of tuberculosis, which causes more deaths per annum than all the other contagious and infectious diseases combined. Contemplate 300,000 tons of consumptive bodies to be buried annually—just think of it! And think of the billions and billions of vigorous bacilli tuberculosis which lie under the surface of the earth, whose life-term is anywhere from five to twenty-five years. Bacilli have been found in the earth from cemeteries where inhumation has not been practiced for twenty-five years. Is it strange that consumption is increasing? And is it any wonder that with our present knowledge of the communicability of this disease the attention of every sanitarian is directed towards its suppression, since it is conclusively proven that rather more than one-seventh of the entire mortality of the world is directly traceable to it?

In order that we may the more intelligently devise ways and means for its prevention, let us briefly review the ætiology of tuberculosis and the manner in which it affects the human species.

Since Dr. Robert Koch, in 1882, announced to the world his discovery of the bacillus tuberculosis, our views in regard to this disease have undergone radical changes. It is now a fairly established fact that this bacillus is a specific pathogenic agent in the production of what we know as consumption. From time to time, as the discovery of the specific germ of other diseases has led us to take measures aimed at its destruction, so in this disease investigation is turning on more and more light upon the nature of this subtle enemy, sooner or later to be vanquished or modified, perhaps, as the small-pox has been.

This special bacillus or germ is a small vegetable parasite, rod-like in shape, having a length of about one-fourth to one-half the diameter of the red blood corpuscle, so that it would require from 7,000 to 15,000 of these tiny vegetable rods, if placed end to end, to measure one inch. The staining of these bacilli, so that they may be readily seen by the microscope, is easily done and a matter of only a few moments' work, and where there

is the least doubt in regard to the diagnosis the physician should at once resort to his microscope.

Bacilli are said to be universally present in the lower stratum of the atmosphere, just as they are always found in the upper part of the earth, with the exception that tuberculosis is rarely ever found over ten thousand feet in altitude, and never found over sixteen thousand feet elevation. Scrapings from beds occupied by tubercular patients, the dust on the floors, on the walls, in the curtains, etc., and dwellings previously occupied by phthisical patients all teem with bacilli. Guinea-pigs injected with these germs die rapidly of consumption. Dr. Osler has estimated that from one and one-half to four billions of bacilli are expectorated daily by every well-marked case of phthisis.

It is hardly necessary to say that the bacilli are not alone found in the lungs, but frequently in every glandular structure of the body and in the bones. And we find it, too, in the disease called lupus, which is really nothing more than tuberculosis of the skin. So you perceive that tuberculosis does not always mean tuberculosis of the lungs, but the fact is we do recognize it most usually in the respiratory organs for the simple reason that they furnish the easiest mode of ingress, and there the bacilli are more likely to find a cultivated field in the bronchial glands and submucous tissues.

But a little while ago tuberculosis was considered hereditary. Now all is different. It is said that it cannot be born in an infant, but must be acquired. This is at least a source of comfort, for how cruel indeed would be the death-rate if to its now known communicability should be superadded hereditary consumption. But that an hereditary susceptibility, which is almost as bad as direct transmission of the germ, is the rule, is now a fairly well-established fact. Not all people are susceptible, nor even all the mammalia, though we know a large proportion of the human species is liable to become affected, and cattle, monkeys and guinea-pigs are most susceptible of the lower animals.

It has become common to speak of a person non-susceptible to a contagious or infectious disease as being immune. The great aim of the present day is to render the human species immune to the bacillus, and on this line Koch, Klebs and others are hard at work. A few years ago the former thought he had pursued the enemy to its lair and forever routed it by the manufacture of a lymph which is now commonly called tuberculine, and, with modifications, tuberculosidine. The world was agog, but was disappointed, for the wary bacillus, hidden in the fastnesses of the lymphatics, eluded its enemy, not always, to be sure, but often enough to make the remedy fall into some sort of disuse and disrepute. Yet the discovery was one of the greatest of the age, and along this line will yet be found, I predict, the remedy to render the human species immune.

What peculiar diathesis, we may ask, or hereditary tendency, is it that opens wide the doors for an entrance of this bacillus? Why some immune and so many not? I will answer that this susceptibility seems to be a condition closely allied to the strumous diathesis, a condition generally hereditary, but may be acquired, so that it is not uncommon for a subject to begin life immune and become susceptible through environment and affections other than tubercular. An untainted heredity is surely the most priceless gift of the Almighty.

By the way of illustration, the human species may be compared to nature's great cultivated field. Struma and its allies are the fertilizers, the bacillus tuberculosis is the seed, consumption the harvest. Let us take, for instance, two subjects, both apparently in vigorous health, but one with a strumous history, for we must not lose sight of the fact that a person with a strumous heredity is not incapable of the maximum of health, the latter is simply susceptible, the first is not. Inoculation of the first with a culture of the bacillis tuberculosis would in all likelihood produce no results. Tuberculosis would surely follow the inoculation of the latter. The first will go through an influenza, an ordinary bronchitis or pneumonia, and soon be as well as ever, whether the bacillus is present or not. The latter readily falls a victim to tuberculosis. As Dr. E. A. Wood has tritely put it: "A strumous person, an open sore, the presence of the bacillus, lymphangitis, bacillary consumption: that is the gamut of fate."

The lymphatic gland is the habitat of the bacillus tuberculosis, and the latter never enters a lymphatic gland without destroying it, but it is rarely, if ever, found in the blood. When found there it seems to be a pretty well-established fact that it is accidental and transitory, that it is on its way to one of the depuratory organs. Indeed, the blood is shown on to be intolerant of the bacillus and the blood corpuscles destructive to its life. When inoculation from the bacillus culture is done, the nearest lymphatics are soon engaged in a lymphangitis and in the susceptible subject general tuberculosis follows. The bacilli may reach the blood in many ways, but they never linger there. Their reception is unfriendly, and those that escape find their way into the nearest lymphatic vessels, there to do their deadly work, and with their swarming offspring proceed to other glands to kill and destroy. So its choicest pabulum is adenoid tissue, and all the remedial agents that have ever established any merit for themselves have been such as have acted upon this glandular system.

Sterilize the lymphatics and the subject is immune. Perhaps along this line of Pasteurism a guinea-pig, one of the most susceptible of the lower mammals to tubercular infection, may be made immune, and it appears to me as quite in the range of possibility, even probable, that

products from its lymph may be used and the human species at last be protected against this now spreading poison.

Every tubercular patient is a menace to the community in which he lives. By far the most common means of spreading the disease is the sputum dried into dust and disseminated by the atmosphere into the lungs of innocent but susceptible persons. But this is not the only means of dissemination. The dairy is a common source of tuberculosis, especially in children, as it is estimated that three per cent. of the dairy cows near our large cities are tubercular.

To sum up the more common ways by which the bacilli enter the human system, we may mention inhalation, the ingestion of bacilli derived from mammals, either as food or drink, by using, or handling infected articles, as money, furniture, etc.

With our present knowledge, no open sore should remain an open sore any longer than possible. More especially should this be observed in the strumous subject.

Let us now briefly consider means for restriction or prevention of tuberculosis. Society must be educated, and surely legal methods are consistent with the highest civilization. We vigorously quarantine against other infectious diseases, as small-pox, yellow fever, cholera, etc.; then, in the name of the commonest of common sense, if tuberculosis is preventable, let the sanitarian overcome the difficulties, if difficulties do exist, and educate the masses, by authority invested in the Board of Health, by literature and every means in his power.

1. In the first place, then, every tubercular patient should be instructed by his medical adviser to see to it, by every means in his power, that others should not suffer through his own affliction, and that his own recovery hinges largely upon the scrupulous care with which he disposes of his own excreta and pathogenic secretions. Let him never expectorate where the sputum will dry. Ingenious paper sanitary cuspidors, cheap and easily procured, may be readily obtained, and these should be daily destroyed by burning. Persons suffering from consumption who spit on the floor or on the street should be subjected to a fine, if, indeed, such a punishment should not be meted out to him whether he has consumption or not. Some of my patients have found it convenient to carry in the chatelaine bag a small wide-mouthed bottle with rubber stopper, in which is poured every morning a small amount, a spoonful or two, of a solution of bichloride of mercury. Into this one may easily and inconspicuously expectorate, and avoid the use of handkerchief or napkin, which should never be used unless they are destroyed before they become dry.

2. Our State Board of Health should by all means make it obligatory on the part of physicians and householders to report to the local Board of Health all cases of tuberculosis, so that the State Board can properly

give instructions to patients and attendants, through their local health officers, of measures relative to the restriction of the disease. Such measures need not interfere with the individual liberty of the sufferer, or in any way hamper him in his usual avocation. The Board is already vested with such authority in regard to other contagious and infectious diseases, and the sooner we add tuberculosis to the list and enforce such regulations the better for the general public. For, as I have already remarked, tuberculosis is contagious, and is so recognized by every progressive medical man. In this connection I may say that it is within the walls of buildings that tubercular infection is almost entirely found, the chance of infection outside being almost reduced to a minimum as compared to the danger within. Intimate household life is responsible for the spread of the disease.

Dr. Flick, of Philadelphia, after studying the distribution of tuberculosis in a single ward of that city, found that about one-third of the houses were infected with pulmonary tuberculosis, and that in thirty-three per cent. of those infected there was more than one case; that is to say, that one-third of all dwellings contained tuberculosis, and of these one-third contained more than one case. Very few physicians of experience can fail to recall households where two or more in the family have died with the disease.

But since it is not hereditary the contagiousness thereof must appeal powerfully to any thinking man. More than a century ago, long before consumption was thought generally to be contagious, a law was enacted in Naples compelling physicians to report all cases of tuberbulosis to the Health Department under a penalty of a fine of three ducats; the second offense was punished by ten years' imprisonment. By the rigid enforcement of such a law, it is claimed that Naples has reduced her mortality from consumption ninety per cent. England and other countries are taking up the matter of isolation of tubercular patients, and are daily reducing their mortality from this disease.

There could really be no greater charity than establishing State Sanitaria in good localities for the segregation and isolation of the consumptive poor, where they could receive proper food and judicious management. Nor would this be poor economy when we consider, aside from the question of sociology, what an enormous saving would result, by the lessened mortality, in the thereby prolonged business activity of thousands of the State's best subjects. Society must by all means be protected, and how better than by the inauguration of such institutions, which we can readily see from the above would not, in the long run, prove a burdensome charity.

3. In the matter of the disposition of those dead of tuberculosis cremation should be the law, rigidly enforced. The body should be wrapped in sheets wrung out of a solution of bichloride of mercury and cre-

mated as soon as possible, for we have seen that live germs are found in cemeteries from two to twenty-five years after burial has taken place.

4. All dwellings and public institutions which have been exposed to infection from patients suffering from tuberculosis should be properly disinfected, and this should be a law. And all beds, carpets, curtains, etc., should be steamed for at least two hours. As a general disinfectant for washing walls, floors and articles of furniture nothing is perhaps better than a solution of bichloride of mercury, one part to a thousand.

5. The State Board of Health should have the power and means with which to cause careful and scientific bacteriological examinations in any case where the condition arouses the suspicion of tubercular infection, as in food products, milk, etc., as furnished in our cities and towns.

In conclusion, I cannot do better than suggest that we adopt the resolutions, relative to restriction of this disease, which were recommended by the Committee on the Restriction and Prevention of Tuberculosis of the American Public Health Association in Chicago, October last. These resolutions, as adopted, read:

1. The notification and registration by health authorities of all cases of tuberculosis which have arrived at the infectious stage.

2. The thorough disinfection of all houses in which tuberculosis has occurred, and the recording of such action in an open record.

3. The establishment of special hospitals for the prevention of tuberculosis.

4. The organization of societies for the prevention of tuberculosis.

5. Government inspection of dairies and slaughter-houses, and the extermination of tuberculosis among dairy cattle.

6. Appropriate legislation against spitting into places where the sputum is liable to infect others; against the sale or donation of objects which have been used by consumptives, unless they have been thoroughly disinfected.

7. Compulsory disinfection of hotel rooms, sleeping-car berths and steamer cabins which have been occupied by consumptives, before other persons are allowed to occupy them.

After the reading of this paper Dr. Bahnson said: "I would like to request the audience please to ask questions or to demand explanation about any points which they don't understand. Some of the terms are naturally obscure to those who have not read and studied the subject. This is a meeting emphatically for all, and we don't want to take up all your time and do all the speaking ourselves, and so please let the discussion be of a thorough and homelike character."

Dr. Whitehead said: "Dr. Battle gave us the remarkable information that ten people are dying daily in this country of ours of consumption. Now, if we knew that there was a man on the outside of this building with a knife who was killing ten of us a day, there would not be one of us who would not be after him with a shot-gun, if necessary, and yet it is the same thing. Ten of us are dying every day, and yet it is being done so easily and quietly that we do not think anything of it. The object of this meeting is to try and explain some means of expelling these various diseases which are killing our people all over the State. It is an informal meeting, and if your modesty is such that you don't want to ask any questions out, write them and send them up to the table and they will be read and answered."

Dr. Battle: "Mr. President, a question has been handed to me to lay before you; they want to know how milk in cows is known to be tubercular; what way there is of telling that cows have tuberculosis."

Dr. Battle: "The milk is known to be tubercular by the use of the microscope. There is a disease among cattle that is known as white distemper, which is nothing in the world but tuberculosis. I think it is called white distemper. The most usual way of discovering whether a cow is tubercular—and this should be always done when there is the least doubt—is by the use of 'tuberculine.' This tuberculine injected into a healthy subject will cause no reaction; it makes no change that you can see; but if the subject has consumption you have a group of symptoms that are unmistakable. There is a slight rise of temperature, sometimes a chill, and fever lasting for several hours; but it is so characteristic and so unmistakable that it is simply impossible to miss it; and you would be astonished to know how little tuberculine it takes to cause this reaction. If you will

take one-sixtieth of a drop of tuberculine and inject it into a human being who has tuberculosis he will have a rise of temperature in two hours; and with the cow if the tuberculine is injected the temperature goes up and the same symptoms follow that show in the human system. Now, the meat of cattle infected with tuberculosis would not give us all consumption, because some of us are immune—that is, some are susceptible to the disease and others are not. and those that are not susceptible to the disease are called immune. I saw that five cats were fed on the meat of a tuberculous cow. Four of them ate the meat and the fifth one ate of a gland. In a week the fifth cat had tuberculosis and in five weeks died. Those persons who are subject to glandular enlargements, which we call scrofulous, are more susceptible than others. If we suspect that a cow is not healthy, then we should have the test made with tuberculine, which is just as easy as it can be. Many of our diseases of the spine with children are nothing more nor less than tuberculosis—not of the lungs, but of the spine. In the name of the commonest of common sense we should do what we can to suppress it."

Dr. Lewis: "Being somewhat of a dairyman myself, I will say that a cow is likely to show the same symptoms that a person does. She will cough and become thin. If a cow has a cough and is very thin, and if she is hard to fatten, if her hair is rough and stands up the wrong way, then you may suspect that she has tuberculosis, but the only way to find out with certainty is by the scientific method of tuberculine. Now, of course, you have not got any tuberculine, but if you will apply to the North Carolina Experiment Station they will put you in the way of having the test made. Now while I am up, and as I am a practical illustration of what Dr. Battle has said to you, I will state that I am the subject of hip-joint disease. My father

died of consumption, and accordingly I always supposed that I had inherited tuberculosis of the hip-joint from him, but Dr. Sayre, who is a great expert, states that hip-joint disease is not an inheritance of tuberculosis, but due to injury. I always had believed that it was hereditary, but now in the light of the present day I understand how it is. I am one of the susceptible ones. Being a very active child I bruised my hip, and being susceptible to the disease produced by the bruise, exactly the soil that the bacillus would flourish in, so that, living in an infected house, and the bacillus, being in my circulation, found that spot, located and multiplied there, producing the destruction of the joint, and now you see how I am afflicted. I have been cured, however, and am a very healthy man. But I want to call your attention to the fact that if you have cows you suspect of being tubercular you had better have the test made at once."

Dr. Battle: "Here is another question, ladies and gentlemen, that has been handed up, 'Should consumptives marry?' Of course that question can only be answered one way. Consumptives should not marry. There is no need of going into that question, but they should not marry. There has been a case reported where a man with consumption had three wives who caught the disease from him and died, and yet he lived. Certainly a consumptive of that sort should not marry."

Dr. Lewis: "While we have a little lull I want to say that we desire to excite your interest and are anxious for your support. We want the ladies, especially, to take hold of the matter of sanitation and help us, as we know that the care of the household is with the ladies. If we can get them thoroughly scared as to these contagious diseases, and if we can get them to take hold of their husbands and sweethearts, instead of being the most unsatisfactory it will be the most grateful work that man ever undertook."

Dr. Murdoch: "I would like to ask Dr. Battle what measures ought to be taken in a school-house to prevent the germs arising from the sputum?"

Dr. Battle: "In answering that I can only say that there are many little things of great danger that escape us, such as a boy or girl using one another's slate. This is a common way of getting the germs from one to another; and the habit of swapping pencils and chewing gum should, of course, be avoided, and the school-room ought to be gone over with a cloth wet with a solution of bichloride of mercury every week or two. Then, I think, that there should be nothing on the floor that could not be removed easily. The school-room should never be swept or the dust disturbed while the pupils are in the house. They are the chief things that we should avoid."

Dr. George Thomas: "It seems to me, Mr. President, that there is one thing Dr. Battle might have added to that; that is ventilation and sunlight. The children are crowded necessarily, and therefore the ventilation should be specially provided for. Sunlight, too, adds not only to the general brightness of the room, but it prevents the growth of these germs. Then there should be a sufficient number of recesses, or recreation moments, during the day to let these rooms be thoroughly aired. It looks to me that without much disturbance the rooms might be thoroughly aired once every hour."

Dr. Lewis: "Excuse me for getting up again, ladies and gentlemen, but it seems to me that there is more danger in the bed-room than in the school-room; and we should always have plenty of fresh air, both in the bed-room and in the school-room."

Dr. Battle: "I will read a little extract from a paper published a few days ago in New York. It tells of a Medical Congress in France in August just passed. After going on

about contagious diseases it comes to consumption, and so I will just read a few lines of this." He then read an article from a paper explaining the right ways of treating the bodies of consumptives after death.

Dr. Whitehead: "Mr. President, here is a question that has been given to me: 'Should cats or other animals, afflicted with these contagious diseases, be allowed to lie on top of the ground after death?'"

Dr. Battle: "I think, Doctor, that they should be cremated in the same way as a human person afflicted with tuberculosis. Certainly it should be very rigidly enforced that if we take care of and cremate human subjects after death we should certainly look after the cattle in the same way."

Dr. Bahnson: "Ladies and gentlemen, the next paper that we have is by Dr. George Thomas, of Wilmington, upon the question of "Quarantine and Disinfection in Contagious Diseases":

QUARANTINE AND DISINFECTION IN RELATION TO CONTAGIOUS DISEASES.

BY GEORGE GILLETT THOMAS, M. D., OF WILMINGTON, MEMBER OF THE NORTH CAROLINA BOARD OF HEALTH.

The act of the last Legislature, entitled "An Act in Relation to the Board of Health," wisely and efficiently provides for the quarantining of all persons sick with infectious diseases; and this quarantine has been as wisely provided by your efficient Secretary with full rules and regulations for both isolation and disinfection. The modern construction placed upon the word quarantine involves not only shutting off the sick and their necessary attendants from those that are well, but it absolutely insists that measures shall be adopted to destroy as far as possible the germs of disease by careful disinfection. This disinfection must begin as soon as the disease is manifested, and can only be finished when the sickness is over, and the patient is either well or dead.

There is unfortunately a wide-spread disposition among the laity to resist the enforcement of such regulations as limit their freedom to go and come at will or that seriously impair the comfort of the family or disturb the domestic routine. If they submit, too often the performance

of the duties which disinfection puts upon them is negligently done, and half measures are worse than none; for they create a delusive security that is too often rudely broken. By a strange twist in human nature there is nearly always a disposition to applaud the imposition of sanitary measures when they affect one's neighbor, but these same rules become irksome and appear unnecessarily severe when they cross the fence and come home to the individual who was so sweetly disposed towards the proper treatment of his neighbor's ailings.

The labors of the bacteriologists, those persevering, delving folks that seek to reach that state of beatitude which is promised to those who know the cause of things, their works have made it evident beyond question, apparently, that all diseases which have a fixed and regular course of approach or incubation, attack and decline, and are imparted under favorable circumstances by an infected person to those who may be exposed, and who are not already protected by a previous attack of the same disease, all of these diseases are the products of specific germs. It is true that some persons are exposed or come in contact with disease and are not affected thereby, and it is claimed that there must be in the exposed person a condition which will allow the germs to reproduce themselves; in other words, the condition must be one of susceptibility. It is not within the scope of this paper to enter this part of the discussion. Nor does it involve the facts which it is my aim to set forth, except to say that disease germs grow best in fertile soi s as other seed, and that robust health and sanitary surroundings do not furnish the resting-place for disease.

It is true that as yet not all the diseases classed as *infectious* or *contagious* have been successfully searched for these specific germs. But those that have been separated are now very numerous, and the list is growing steadily. Each accession to the list so markedly declares the truths of the germ theory of disease that it is not too much to hope that in a time longer or shorter the diligent search of these tireless workers will find the morbid material of each and every ill to which mankind is liable. Such a discovery will bring with it new ideas of treatment and surer methods.

We read in the daily papers of the ravages of cholera in Europe and yellow fever in the tropics. Now and again, in spite of quarantine that is so rigidly practiced, the yellow fever creeps in and lays waste a town on the south-eastern seaboard. These defenses for prevention are all wise, and need to be constantly watched and renewed, but the monthly *Bulletin* of the Board of Health tells a tale that deserves our attention right in our own midst—a condition that bespeaks carelessness or wanton neglect. I refer to the frequent reports of the prevalence of typhoid fever in all parts of North Carolina. For instance, the disease was reported in sixty-six counties of the State in July. So great were the

number of cases at one time in the summer of 1893 that the Board of Health seriously considered the advisability of an investigation into the causes of these outbreaks, and of suggesting some means for the control of the disease. Unfortunately the means for this extensive work were not in hand, and the only method for the change which we all so ardently hoped for was to urge the physicians through the *Bulletin* to look into causes of these localized epidemics and report them to the Secretary at Raleigh.

Early in the fall of 1893 I was in a small town in this State and had the pleasure to be closely associated with a very able physician. During my stay in his town he told me of so many cases of typhoid fever among his people that I was astounded at his statements. At the time of my visit he had three cases on his list, two in the town and another one a short distance in the country. As I rode through the streets with him he pointed out houses here and there where cases occurred and recovered until I was constrained to ask him if there was a family in the town which had escaped the disease, and it seemed there were very few if any. I do not mean that all this had occurred in one year, but in a comparatively few years, showing the continuance of the poison in the borough. The town is beautifully situated in the hills of middle North Carolina, and is the home of numerous wealthy and refined people who have enjoyed the benefits of education and travel; and yet they are all under the menace of this disease, unless luckily they have survived an attack and are immunized. It was not in my power to demonstrate that the drinking water of the town and the soil air were the causes of this lamentable state of things; but the location of the wells and springs that I saw and their relative position to the outhouses suggested a very probable solution of the difficulties. The drainage of the stables, cow-lots and places for the deposit of human *excreta* often seemed to have easy access to the well or spring. But the water was bright and clear, and its very sweetness masked the danger and *pro tanto* added to it.

This fever is such an old acquaintance that its modes of distribution have been popularly neglected, and a *laissez faire* policy has come in to blind the people to their danger, prompted by the feeling that these outbreaks are not to be accounted for or prevented, and must be set down as a woful dispensation of Providence. My friends, it is a disgrace to the faith of an humble, loving Christian to lay such a charge to a beneficent Providence. The people of Plymouth, in Pennsylvania, lived in a mountain village, and drank the water collected in a reservoir which was fed by springs flowing out of the mountain side. They were rudely awakened to the fact that their homes were invaded by an epidemic of typhoid fever, and no local cause could be found for its prevalence—so prevalent was the disease, and so dire the disasters attending it, that the community felt forced to call on the State authorities for help, and for physi-

cians and nurses. They were met with prompt response. Hardly a home was left untouched by the hand of the destroyer, and the well were not strong enough in numbers to nurse the sick. The State Board of Health set up a rigid investigation into the cause of the epidemic, and for a long time their efforts seemed without avail But one day in the wanderings of these tireless searchers they went well up the mountain side above the reservoir. Below them in the valley lay the town over which brooded the shadow of death, and between them and the stricken village was the reservoir full of sparkling water, glistening in the happy sunshine: its surface broken into wavelets by the balmy wind that gently drifted out of the mountain side and towards the valley. It seemed too much to lay the disease on that water, but not far away they found a cabin which contained quite a family. Inquiry elicited the fact that during the winter previous to the epidemic one or more members of this family had sickened with a fever, some may have died, but of this point I am not sure. The frank description of the sickness made it very clear that these people had suffered with typhoid fever, and when the inmates were asked what had been done with the watery *dejecta* of the patients, they said they were thrown out on the snow. The spring came and with it the thaw, and the germ-laden water was poured into the reservoir with such death-dealing results that men's hearts failed them in the great emergency. Don't call this a disposition of Providence, but a careless indisposition to protect the water-shed that supplied their reservoir. The loss of time and lives that resulted was only equalled by the flood that swept away the neighboring village of Johnstown.

Every foot that one digs into the ground for a well drains two feet surface; in other words, the radius of drainage is nearly twice the depth of the well. Add to this danger the inclines, too often existing between the kitchen back windows, the stables and the middens, all readily leading the water towards the spring or well, and the danger to which people recklessly expose themselves is fearful. The wonder is that they escape disease in some other shape, even if it fails to come as typhoid fever. The closet or midden can be made with a water-tight box or pail for the reception of *excreta*. Dry ashes, mixed with slaked lime and charcoal, can be kept in this outhouse, and a small portion of it be used whenever the midden is visited. The method is cheap, rational and reasonably effective. The receptacle, whether box or pail, can be removed, emptied of its contents in a safe locality too far away from the premises to affect the well or spring, and be returned clean for use again. Of course in case there should be typhoid fever in the house special precautions must be observed; but of this later on. It is better to prevent than to attempt to cure. There is some trouble attached to the care of the premises indicated above, but it is worth it. If your neighbor is careless your persistent cleanliness may be the cause of his reform, and the

good results will spread if the earnest people will persevere in doing what is right. Don't pour kitchen slops on the ground; don't allow decaying parings of vegetables or other garbage to accumulate about the premises. If no other means for their disposal is at hand, put them away from the house and covering each day's deposit with slackened lime.

It is not easy to demonstrate the connection between the milk from certain dairies and cases of typhoid fever, but it is moderately certain that a connection exists, and so common an article of diet needs to be carefully guarded. The water the cows drink and the water used in washing the utensils in which the milk is kept ought to be especially looked after. Keep the stables clean and the lots dry; it preserves the health of the cattle. The cleanliness about all the premises does much to starve out disease.

The question of water supply involves so many items of great importance that in the short time allotted each paper at the meeting all the points arising under this discussion cannot be brought out. The disposition in all towns of much size and increasing population is to provide a public water supply. The protection it gives against dangerous fires in communities, as well as the convenience of such supply for domestic uses, probably often lead to the establishment of these water-works. Unfortunately the use of this water for drinking is too often an after consideration. For instance, the Board of Health had occasion to examine the water furnished one of the most prosperous towns in the State. The chemist's report made it very doubtful in quality, and a visit was made by two members of the Board to the town, and careful investigation was had into the source of the supply. This was a small river, running from its source through a large extent of farming country, and near the point of intake, within a mile, there emptied into the river three streams. One of these drained the edge of the town at a point inhabited by thriftless, dirty negroes; another came from a hamlet several miles away, and the third one had situated on its course, about a quarter of a mile from the river, a whiskey distillery. One hundred hogs were fattening upon the refuse of the distillery; the sour fermented mash was fed to them in shallow vats over the stream, and in the most hoggish fashion they wallowed in their food. The stream bed from the still-house to the river was the range of these animals, the sick and the well. It was polluted by their droppings and the slush that came from the feeding vats, and made an unwholesome addition to the water that the town people were to drink and bathe in. The lesson teaches that the towns having a public water supply must have the power to control for considerable distance the water-shed, and where the character of the water is doubtful that all the more improved means of purifying it should be adopted. But this is somewhat of a digression. Let us see what provision can be made

for the disinfection of typhoid fever *dejecta*—how they can be made harmless. Section 21.*

I wish to say that no more instruction is needed than to follow the regulations issued by the Secretary of the Board. They are complete, comprehensive and concise, and do him great credit.*

To these let me add that if the persons in charge of a typhoid fever case cannot get the disinfectants prescribed in these instructions at once they will go a long way towards securing safety if they will see that the *dejecta* from these patients are promptly and freely covered with boiling water before they are emptied and that all soiled clothing is treated in a like manner before it comes out of the sick-room, to be again washed in boiling water afterwards.

The history of every epidemic of diphtheria will, I believe, show a thoughtless disregard of just such instructions as those issued by Dr. Lewis, the Secretary of the Board. They are not difficult to understand or necessarily the outcome of knowledge possessed only by physicians.

Thinking people will easily see, after a moment's reflection, that *all* communication with a house, in any manner, where diphtheria prevails must endanger their lives and probably lead to the spread of the disease.

The same is true of scarlet fever, and the ease with which the germs of the disease are transported makes it the more necessary to observe the precautions set out for its prevention. The quarantine of these two diseases may be fairly considered together, as they very often occur at the same time in the same patient, and as the measures are practically identical. We have said that the morbific germs are easy of transportation and transference. This makes it necessary to insist upon the isolation of the patient and the nurses and the preparation of the sick-rooms for this quarantine. All clothing that cannot be retained permanently in the room and may be destroyed afterwards, or that cannot be boiled and treated with the disinfectants already noted, should be moved out immediately after the attack is declared. If any of the clothing has been in contact with the patient it can only with safety be taken out under boiling water and must be boiled for an hour afterwards in one of the solutions noted in the instructions.

Woolen goods, if possible, ought to be steamed. Certainly they can be subjected to fumigation with sulphur fumes. Leather and rubber goods may be freely washed in a five per cent. solution of carbolic acid. Carpets should be removed if possible, or, if retained, should be burned after the patient is released. Safety has been insured, to my knowledge, by sweeping a carpet thoroughly with a broom kept wet with the bichloride of mercury solution. Don't allow any of your neighbors to come

*See Act in Relation to the Board of Health and the Instructions for Quarantine and Disinfection incorporated in the Annual Report of the Secretary of the Board to the Conjoint Session at Raleigh.

in unless it is necessary, however well-meaning they may be. Don't be deluded with the statement that they are not afraid. Unless they will submit to the rules of the quarantine and be disinfected before they leave the sick-room, they may and in all probability will become vehicles to send the poison still further on its travels. Don't forget that a piece of membrane on a rag, or in a vessel, if thrown out on the ground may be dried and driven into new quarters of attack by winds. Burn up the rags and disinfect the liquids before emptying the vessels. There is a form of pseudo membrane that attacks domestic animals. It is therefore best to exclude dogs, cats and birds from the sick-room, as they may become infected, or, at least, be carriers of the infection. Don't have the carpets and rugs from the sick-room, if they are not burned, beaten in the yard until they have been swabbed and scoured with bichloride solution after sulphur fumigation. Recollect that a person who has suffered from an attack of scarlet fever and has as its sequel a discharge from the ear for a long time carries about the germs of disease.

Of small-pox there is little to be said except to absolutely isolate the patient and nursery until after death or recovery of the sick person, and then burn everything that has been used about the person, disinfect the quarters, whitewash or paint the walls. But don't forget that everybody should be vaccinated. That's prevention, and it is safe and certain.

I wish our legislators could be persuaded to enact a law similar to one just now in force in several of the States, that no child can enter a public school without a certificate of successful vaccination. Typhus fever hardly concerns us, so infrequent is its appearance outside of large cities and thickly populated communities.

When it becomes necessary to meet yellow fever, thanks to care of the Marine Hospital Service, the experts of this department will take charge. Cholera will always bring consternation, and little doubt that it will be promptly isolated and stamped out.

The fact that an attack of an infectious disease establishes for the person recovering from it a freedom from danger thereafter of the same disease has led the bacteriologists to study the phenomena of this freedom, an immunity as it is called. What the final verdict will be it is yet too soon to anticipate definitely, but there is a promise held out by the protection against small-pox by vaccination that in some way this process of immunizing may be so adapted to other diseases of an infectious or contagious character that the cases and their dangerous quality will be reduced to a minimum. Pasteur's inoculation against the poison of rabies has been more or less successful. Hoffkine seems about to justify his claims to be able to ward off cholera by protective inoculation. The French and Germans have exploited an antitoxine for the prevention or cure of diphtheria. So the work goes on. The days of the laborers in this interesting field are full of promise, and the nights of

disease and fearful death seem to have given to them the hope of a coming dawn.

But this does not yet supply the want that unsanitary lives and surroundings create. In spite of warnings, in spite of the teachings of the doctor and even the secular press, the people put away from themselves the patent truths that cleanliness demands increasing vigilance, and vigilance in turn gives a reasonable hope of safety. The surgeon has caught the prime point of this lesson, and he is extending his field of work almost without limit. Regions of the body subject to disease and injury and needing the surgeon's care but which formerly were considered too dangerous to enter now lie ready for his exploring and curing hand under the rules of cleanliness.

The brain, the chest, the throat, the abdomen have all been opened, the organs have been exposed to view, diseased portions been taken away, the resulting gap been sewed up and health restored. The skill of the surgeon would not avail if he did not appreciate and apply to practical purposes the fact that success in his specialty demands that he, his assistants, his instruments and his surroundings should be clean. This is antiseptic and aseptic surgery. The presence of dirt means death, and its absence insures a chance for life in cases otherwise desperate. We must keep our environments healthy if we would be healthy. Disease germs can only grow and flourish in a fertile soil, which a hygienic condition of persons and premises does not afford. The individual who lives a sanitary life, that keeps his home and surroundings in a condition of sweetness and purity, does more to starve out disease germs and prevent sickness than all the drugs and medicaments of all the shops can ever accomplish for a cure when once the foe has laid siege to the body. If sickness comes in the shape of infectious or contagious disease besides the care for the patient and the sick-room clean up the yard, the stables and barns—look well to the enemy that is still lurking at the gate.

When the Carthaginians had carried home their mercenaries after the first Punic war they were sadly in arrears to their hired soldiers. In vain they sought to distract them from the demands they made for their hard-earned money. They made great feasts for them, amusements were provided and extravagant promises indulged in, all to put off the final day of settlement, hoping for some unlooked-for event to relieve them of the duty of discharging a just debt. The battle-scarred veterans grew impatient at the delay and their patience and confidence being destroyed, they broke into revolt against their officers and again demanded for the last time their money. No satisfaction being accorded them, they declared their intention to sack the city, and accordingly lay siege to it.

Every device that their training as soldiers had taught them was set in action against the beleaguered town, all the machinery that was known to warfare in that age was set in motion. They destroyed the food, they

poisoned the water so that fish could not be caught, they cut off the food supply from the outer world, at the same time that they were spreading consternation and alarm by their persistent and ofttimes nearly successful attempts to make a breach in the walls. At last one man of their number, formerly a slave who had been liberated by them in an early attack on the city, at the risk of his life climbed up the arches of the aqueduct and made a breach in it, and the great city of Carthage was deprived of its water supply.

Disaster and death, an end of the war worse than a breach in the walls and the sack of the city, threatened the inhabitants, the people who had failed to do their duty.

So in despair they made sacrifice to Moloch. Innocent little children, in nowise connected with or responsible for the events that were frightening the lives out of these people, were cast into the fire to appease the wrath of the offended god. Tender women, their babes at the breast, slaves from the factories and mines, prisoners from the cells, made food for the flames of this fanatic ignorance. At last they went again to Hamilcar, their great general, whom for jealousy and envy of his fame and power they had set aside, and besought him to save them from the destruction that seemed imminent. He took charge, and after a series of battles, fierce conflicts set in order by his great genius and arranged to the minutest detail by his great experience, he drove the hordes from the walls into the plains and thence into the mountain fastnesses, to their death.

We burn sulphur and spread disinfecting solutions; we open the doors for the fresh air and the windows for the sunlight; we spend days and nights watching the sick, these victims to the Moloch of disease, and we recklessly pour the dejections from a typhoid fever patient, undisinfected, or carelessly done, on the ground at random, where the next rain will take up the poison and wash it into the water we or our neighbors drink; or it is dried, and the winds waft about the poisonous germs mayhap, and a new victim tells the tale of the reckless want of care.

A child lies sick of diphtheria. It is too much trouble to disinfect one's person or change clothes when the room is left. The nurse comes in contact with the other little children and a new case appears. It is too much trouble, it is said, to take up the carpets and carefully destroy the cloths on which the child expectorates or discharges the irritating fluid from its nose.

Another has scarlet fever. It is a sore trial to shut the door always against one's incoming and unwise friends and against one's own occasional escape. Trifling disinfection is done. False economy says don't destroy all these clothes and bedding; wash them; that is what this one or that one did, and they escaped. The doctors are unnecessarily particular they say. Alas! the enemy is still left hammering down the

gates, and sacrifices to Moloch will not suffice. He must be driven from the home and destroyed. Don't temporize; clean up your premises, as well as your house, and keep them clean.

Sickness and death cost more in money than the time or the articles you lose, and who can measure the cost of weary days and nights of watching, or fix the loss that sorrow and grief entail?

Let me conclude my tax upon your time and patience by reciting to you the history of three cases of yellow fever that occurred during the Jacksonville epidemic. It contains all the lessons I have sought to teach you.

Dr. John Guiteras, of the University of Pennsylvania, is one of the best yellow fever experts in the country, as well as a most intelligent and cultivated physician and pathologist. He was formerly one of the surgeons of the Marine Hospital Service, and is yet, during his vacations, on the staff of that splendid department. He was present during the epidemic alluded to, and told me the fact I am about to relate. A certain man lived in Jacksonville for the greater part of the year, but had a country home thirty or forty miles from the city and a large saw-mill a few miles further on. He found that he was infected by the fever, and escaped by private conveyance, passing the cordon around the town and the detention in the camp which had been established for the observation and care of persons leaving the stricken place. He rode in his buggy to home in the country, sick with the yellow fever. His wife was a bright, intelligent woman, and among her many charming traits and virtues one of the best was a persistent determination to keep her home and its surroundings clean. She had succeeded, and the advent of her gudeman, laden with the germs of the terrible disease, made no disturbance in his home. Before his convalescence was complete he went down to his mill and had a relapse. The condition of things there was just the opposite of those existing at his home. He was domiciled and sick in a small house occupied and kept by one of his employees and his family. The refuse of the kitchen, the garbage from the house, the *excreta* of the inmates, those of the sick man included, were carelessly thrown in the immediate neighborhood of the house. The man grew worse, and one of the inmates of the house was attacked with a suspicious sickness, and Dr. Guiteras was sent for, and on his way went by and stopped at the home of the mill owner. About the time of his arrival at the mill the third person was attacked, and he immediately recognized in the two new cases the outbreak of yellow fever. Fortunately they all recovered, and the disease was stopped with these three cases. But mark the moral of the story. The sick man from Jacksonville goes first to his own home, mingling freely with the inmates of his house for several days, and grows better of disease. He is in a clean house, situated on clean premises, thanks to his most excellent wife. No one of his family

is attacked. As soon as he can move again he goes to his mill, still a sick man, conveying the seeds of disease. He enters a home carelessly, slovenly kept, and the premises are, strictly speaking, dirty. The result is prompt to ensue. The atmosphere is polluted and fitted for the reproduction of the disease which he has carried with him, and two of his hands are seized. The timely arrival of Dr. Guiteras and his active efforts for the betterment of the surroundings put an end to a threatened outbreak of yellow fever in the pine woods. The application of the story is so universal that, in conclusion, it is only necessary to say: Imitate the example of this able housekeeper; keep your premises clean and enjoy the immunity from infectious or contagious disease that warded off the fell destroyer from her and her loved ones.

Gentleman in the audience: "Should pig-pens be allowed in a well-regulated community? Are they not promoters of disease of many kinds? Judging from the odor that we have had from these pig-pens on hot nights, it seems that they might be promoters of many diseases."

Dr. Thomas: "To that I shall answer, unhesitatingly, yes. It is impossible to keep a pig-pen clean, and they are so dirty that they must be promoters of sickness. It is a hard thing to drive the pig-pens out of a town—it was in my town; the poorer people thought it very hard to have their pig-pens driven out of the city."

Dr. Lewis: "Ladies and gentlemen, I wish to draw your attention to the fact that this quarantine is the key-stone to all disinfection. To quarantine is to surround the enemy, and when we have surrounded him the next thing to do is to kill him. It is of great importance that while we have our hands upon the germs we should destroy them, for if we let them escape there is no telling the amount of damage they may do. Now, a practical illustration: Scarlet fever appeared in a noble family in England. Several of the children had the disease. The family went away for a year, and the sick children recovered. That was in a day when quarantine had not been heard of. At the end of the year they returned, and one of the children's maids on looking into a bureau drawer found a little piece of red

flannel that had been used on one of the sick children. Well, she was young and gay, and she threw it around her neck and danced around the room. The result was that the members of the family who had escaped the first time had the disease. We have a great many doctors that have been wondrously successful with diphtheria. One doctor will say that he has never lost a case of diphtheria. Another doctor will say that he has been very unfortunate with that disease; and yet we know that Doctor No. 2 is a very much better doctor than Doctor No. 1. How can we explain it? The cases of Doctor No. 1 were not true diphtheria at all. There was no germ of diphtheria, and therefore there was no danger, and for that reason Doctor No. 1 was so successful. Now that is the difference between the two cases of diphtheria; one is the real disease, the other something superficially like it. Of those cases where there is no germ none die; of those with the germs from 40 to 60 per cent. die. Remember that if you will destroy these germs while you have your hands upon them, you can avoid all these infectious diseases.

"Now, if you have any of these diseases in your family and don't quarantine your premises; in other words, if you do not prevent the neighbors from coming in to see you, or if you let the germs get out of your house and affect your neighbors, then you are guilty of criminal negligence. I wish to impress upon the audience, if possible, the great importance of this quarantining of cases of contagious disease."

Dr. Bahnson: "Is there any one else that would like to ask a question?"

Gentleman in the audience: "I have one which I know is very simple, but I would like to have it explained. It is about typhoid fever. A short time ago I was passing through a county in this State that was the driest and cleanest-looking country that I ever saw, and yet there is more

typhoid fever in that section of the country than any section in the State. For twelve or fifteen miles there is not a creek or a branch. It is as dry and sandy a country as I have ever been through, and I have traveled a good deal, and there is more typhoid fever in that section than any place I ever saw in my life. There was one house in which the whole family had died of typhoid fever. There was one old man that had the fever, and we could not persuade him that he was not going to die, because everybody else around there had died."

Dr. Thomas: "Do you know what connection there was between the houses?"

Gentleman: "I do not know, sir. The country was very sparsely settled."

Dr. Thomas: "Were there any streams on any side to which the cattle might get?"

Gentleman: "There was one bottom."

Another gentleman in the audience: "Mr. Chairman, I think I can explain it. Several of these people have hog-pens and stables above their springs, and among other things I will say that the care of their sick is very poor. Instead of isolating the patient and keeping the patient to himself, the neighbors go up to the house at night, and sometimes you will find fifteen or twenty people in the neighborhood around there. They go in to see the patient. I went to a funeral down there where a man had just died of typhoid fever, and I suppose there were a hundred or one hundred and fifty people at the funeral, and against my advice there were about fifty women and about twenty-five babies there who went up by the grave where the open corpse was exposed to view. The doctors down there can verify what I say."

Dr. Battle: "I would like to say just a word in this connection. It is so hard to say exactly how this contagion is spread. In a prosperous city in England the people

began dying of typhoid fever. They could not locate the cause, but finally somebody suggested that they look into the milk supply of the town. It was found that the people who had died of typhoid fever, and who had it in their families, all patronized a certain milk dairy. They supposed the typhoid fever originated there. At first they could not discover anything wrong. On examination of the dairy it was found to be perfectly clean, and everything seemed to point to cleanliness. Some one asked where the milk-cans were washed. It was discovered that these cans were washed in a well of water that had not been used for years. The milk was all right when it started, but these cans were washed in an old well that was found to be alive with the germs of typhoid fever. We say that typhoid fever can only come by drinking impure water, but it is not so."

Dr. Whitehead then moved that an adjournment be made until 3:15 P. M. This motion was carried, and the morning session adjourned at 1:10 P. M.

AFTERNOON SESSION.

The afternoon session convened at 3:30 P. M., and was called to order by the President, Dr. Bahnson. He then introduced Dr. R. H. Lewis, of Raleigh, who read a paper entitled "Drinking Water in Relation to Malarial Diseases":

DRINKING WATER IN ITS RELATION TO MALARIAL DISEASES.

BY RICHARD H. LEWIS, M. D., OF RALEIGH, SECRETARY OF THE NORTH CAROLINA BOARD OF HEALTH.

Many years ago the writer of this paper, before he had heard or read anything suggesting or supporting the view that malarial diseases were introduced into the system through the medium of drinking water, had his attention called to it in a striking manner by a statement of facts on the part of a relative living in one of our eastern towns.

The statement was that in her father's family, comprising so many persons who drank cistern water, malarial diseases were unknown, while in that of their next-door neighbor, consisting of exactly the same number of adults and children who drank from "the best well in town," they were rarely absent. My attention having thus been directed to the matter, it was not long before the opinion, which was confirmed by other evidence of a similar character, became a conviction, and for years I have not had a doubt that drinking water was one of the principal if not the chief one of the avenues by which the malarial poison obtained an entry into the human system. Until quite recently the opinion almost universally held was that it was introduced through the air only. The very name *malaria*, or bad air, is significant of that view. There is no question that the poison does exist in the air of warm climates in certain localities, especially in low, wet soils loaded with decaying vegetable matter, or in other localities not so low, but where the subsoil water is near the surface; that it is most abundant at night, particularly in the air nearest the ground, and that it is breathed in through the lungs.

As to the nature of the poison many theories have been promulgated. Up to 1866 the universally accepted opinion was that it was gaseous in character. In that year Dr. Salisbury, of Cincinnati, Ohio, announced the discovery of an *alga*, or small water plant, which he assigned as the cause of malarial fever. While his conclusions were not generally accepted, inquiry on that line was stimulated, and from time to time various microscopic organisms were suggested as the cause, none of which, however, stood the test of experiment. But "in 1881 Laveran claimed to have discovered in the blood of malarious subjects, in connection with the red corpuscles, rapidly moving filamented spherical organisms of about the same diameter as the corpuscles. * * * Many investigators who have followed in Laveran's track have corroborated his testimony, and hence there is a growing consensus of opinion that malaria is due to the introduction of *plasmodium malariæ* into the system; that it attacks the red blood corpuscles, lives and grows within them, and finally disintegrates them"—the explanation, by the way, of the familar fact that the subjects of chronic malaria are always very pale and bloodless. Since the above was written in 1892 favorable evidence has accumulated, and it is now generally believed that this little blood parasite—this microscopic vampire, so to speak—is the cause of this kind of diseases.

Now, is this poison carried in water? That is the question before us. That it is a fact I have not a doubt, and my aim and hope is to prove it so completely to the satisfaction of our people residing in malarious districts as to induce them to seek such a water supply as cannot be contaminated by it. As the Executive Health Officer of the State, I feel sure that in no other direction can larger results in the way of preventing sickness be obtained than by bringing about a change in the family water supply from the ordinary surface well, almost universally used at

present in the eastern part of our State, to *deep* driven or bored wells, or, still better, cisterns.

Appreciating and indorsing the sentiment expressed in a favorite saying of one of my former teachers, that he "would not give one bare-faced, bald-headed *fact* for all the theory in the world," and realizing how much more effective an argument in the concrete, as it were, is than in the abstract, it is my purpose to attempt to make the demonstration, not by a process of abstract reasoning, but by the citation of well-authenticated facts, first as set forth in the writings of others; and, secondly and chiefly, as they appear in letters from our own "home folks" giving their personal experience.

As long as the gaseous theory prevailed it was natural that the water-transmission of the poison should not have been suggested itself; but as soon as it was shown to be a solid that view was brought forward, and first, so far as I know, by Laveran himself. The conclusions arrived at by him on this subject are: "There have been observed cases in which, in the same locality, persons living in identical conditions, but using drinking water from different sources, the one group being attacked in a large proportion, while the other group of persons are scarcely affected at all.

"2. In certain otherwise unhealthy localities the paludal fevers have been seen to disappear by supplying pure drinking water instead of the previously used stagnant waters.

"3. In localities otherwise healthy one can contract intermittent fever by drinking water from an unhealthy locality. The persons most affected are those who drink the water most freely.

"4. Travelers in malarial countries have found that on boiling their drinking water they escape the disease in a large proportion of cases."

Dr. H. Martyn Clark, of the city of Amritsar, India, in a most interesting paper read before the Scottish Geographical Society in April, 1892, says: "The malarial poison is usually breathed into the system, but it is, in my opinion, quite as commonly imbibed. Water is contaminated in two ways: either by the power it has of absorbing malaria which passes over its surface, or, in the case of wells, through the subsoil water. * * * In 1884 a party of workmen sent to repair a bridge over the Chuka drank of this stream, and out of thirty only three escaped fever, while several of them died."

In the article on "Malaria," page 350, Vol. II, of Stevenson and Murphy's "Treatise on Hygiene," 1893, the following case recorded by Boudin is quoted: "One hundred and twenty soldiers embarked in the *Argo* for transport from Bona, in Algiers, to Marseilles. During the voyage one hundred and eleven of them, thirteen of whom died, suffered from different forms of malarial fever. Two other vessels, carrying between them six hundred and eighty soldiers, also from Bona, and arriving at Marseilles the same day as the *Argo*, had no cases of illness at all, and the only ascertainable difference of circumstance between the

troops in these ships and those in the *Argo* was the difference of drinking water. The latter were exceptionally supplied with water, which was said to have an unpleasant smell and taste, from a marsh near Boma; those on the other ships were supplied with good water. Finally the nine soldiers on the *Argo* who escaped were said to have purchased wholesome water from the crew of that vessel."

In an article by Dr. Bartley, on the "Relation of Water to Paludal Poisoning," in the *Brooklyn Medical Journal*, and republished in the *North Carolina Medical Journal* for February, 1893, these cases are quoted: "The villages of Warrington and Woolsey, in Florida, had been considered healthy places up to 1872. After that they became very malarious. Previous to that date almost the whole water supply had been from a spring of pure water. About 1872 driven wells became popular, as water could be had at a depth of a *few feet* (italics mine), and most of the residents had their own wells. From this time malaria became very prevalent, and it is believed from the change in the water supply." Again: "In January, 1866, a company of forty healthy marines were sent to the Navy Yard of Pensacola, Fla. During the first year frequent attacks of malaria began to show themselves among these men, which increased in number during the second year, and during the third year the disease became so prevalent that before August twenty-five of the party were in the hospital at one time. During this year they were so broken down that they were all sent to Norfolk, Va., where they all recovered. These marines drank the water from a driven well at the yard. The officers and their families drank only from a cistern, and no case of malaria appeared among them, proving that the wells were probably the cause of the sickness among the marines." Dr. Bartley also quotes this from the *Sanitarian*, 1892: "In 1875 the Naval Hospital at Pensacola was rebuilt. It proved to be a very unhealthy place, malarial diseases being very commonly contracted by patients and all others who came there. This continued until 1890. At this time there was a change in the water supply. A cistern was constructed, and the use of well water from the driven wells was abandoned, with the cessation of malarial attacks. The soil at the location of the hospital is composed of a sandy top with a swampy marl underneath. This peaty soil contains organic matter, and in some way produced these diseases." Likewise this: "In the report of the Marine Hospital Service for 1890, page 12, signed by Surgeon General Hamilton, he says: 'The experience of the past year confirms the previous statement that malarial diseases are contracted through the medium of food and drinking water."

In the April number of the *Southern States* there appeared a very interesting article by Mr. James R. Randall on "Malaria Superstition and the Water Problem." While not prepared to indorse Mr. Randall in the opinion that the malarial poison is not introduced into the system at all through the air, but through the drinking water *only*, I am much pleased

to quote, in part, his statement of facts. He says: "A large part of Southwestern Georgia was a pest-hole. It was proverbial for chill and fever—generally styled malarial fever—hæmorrhagic fever, and a variety of choleraic symptoms. Mr. Fort by experiment disclosed that Southwestern Georgia was in the artesian basin, and that, by boring about six hundred feet below the surface, flowing wells or energetic geysers were easily developed. As these splendid fountains of pure water were commonly utilized there was an instant, a magical change of sanitary character in that region. The diseases hitherto ascribed to the air vanished, and that section of the State became a sanitarium, the healthiest of localities. The old conditions of environment remained, but the mutation was in the water supply. The man who with this object-lesson before him still clings to malaria may exist, even in the artesian region of Southwestern Georgia, but he is a veritable dweller in the cave of Adullam, and with some brethren an ancient superstition of this character dies hard and lingeringly.

"At several places in South Carolina, as well as in Georgia, the most wonderful results have followed from the introduction of artesian water. Yemassee, in the rice country, long regarded as a death-trap, became exceptionally salubrious, and its water was in request all around. Langley, S. C., a manufacturing village, had an evil repute for 'malarial' fevers. The cotton mill there sometimes closed on account of sickness among operatives, and was habitually crippled. So soon as the surface wells were discarded and water obtained from a natural geyser, a boiling spring in the vicinity, there was an astonishing metamorphosis. The place became noted for health: the factory was always full-manned. Its stock improved in price, dividends were regularly paid, and out of reserve funds the capacity of the concern was nearly doubled. It was with great difficulty that the managers were convinced that it was surface water and not the atmosphere that had previously wrought such disaster.

"On swamp plantations, where since the beginning of the century disease and death from fever raged, artesian water performed its usual prodigies for white and black. On a plantation near Augusta, where the white people used this water and the negroes insisted upon drinking from surface wells, the contrast was marked. The whites had uncommon freedom from malady and enjoyed splendid health, while the negroes were constantly sick."

I would call attention just here to the fact, accepted among scientific observers, that the negro races are less susceptible to malaria than the white races, which makes the illustration given still stronger. Mr. Randall goes on to add: "It was demonstrated on these places that the swamp air is as pure as that of mountain top," a conclusion, however, that no one familiar with the literature of malaria can accept—yet awhile, at any rate.

The following from an article by Dr. W. H. Daly, of Pittsburg, Pa., in the *Medical Record* of September 15th, is extremely valuable, as coming from an unacclimated physician exposed to the conditions most likely to cause malaria:

"Observations and studies on the subject, and investigations made in various districts from Manitoba to Louisiana, and all along the southern coast of the Atlantic Ocean, and of Cuba, Yucatan, and other districts in Mexico, lead the writer to the conclusions that so-called malarial disease is not easily, if at all, contracted by inhaling so-called malaria or bad air of the low, swampy, or new lands, but it is distinctly, if not almost exclusively, due to drinking water that has come into contact with and become infected with the malaria germs or infusoria that exist in the earth and waters of the swamp and lowlands. This germ does not ordinarily, if at all, float in the air during the day, nor does it find easily a vehicle in the fog or vapors of the night. * * *

"I am fully aware that in taking the ground I here occupy I may be considered to be too radical and that my position may be regarded as untenable. If so I can only answer that every observing medical man must and is bound to tell honestly and fairly what he has gathered from his own experience, observation and studies, and it must be considered that my observations have been prolonged, extensive and fairly intelligent, and made not, so to speak, second-hand, but personally and upon the ground in districts distinctly malarial, and that during the years that I and others had been careful to avoid the mists and fogs of the malarial regions as well as the outdoor night air, but all the while using the surface, swamp or shallow well waters for drinking, I as well as others of my friends suffered from malaria, so-called; but later on and during the past twelve years, while abstaining from drinking the surface or well water and with the utmost freedom of exposure to the outdoor night air, fogs, rain and mists at all times, night and day, we have enjoyed complete immunity.

"Whoever has shot wild fowl knows full well that the best opportunities come to a sportsman amid storm and rain, with the early mists of the morning and when the marshes are redolent with the vapors of the evening, just at nightfall, when the wild fowl are flying to and fro, seeking their favorite haunts in the marshes to sleep.

"Then there is the journey of miles homeward to the club-house, farm-house, or camp, in the small ducking-boat, that brings one to the fireside possibly not earlier than eight to ten o'clock at night, so that exposure is positive and close to the marsh and water, as one is sitting in a small boat.

"I mention the foregoing as relevant, since medical men are still the readers and learners from the classic text-books of Watson, Tanner and Niemeyer, not to speak of many others."

Remembering how very conservative a rural population always is, and how suspicious and sceptical a great many of them are of statements printed in a book, particularly when those statements set forth views that they are loth to accept, and are made by strangers living a long way off, I concluded that it would be best to obtain the bulk of the evidence from our own people. With that end in view the following circular-letter was sent to every registered physician in all the counties considered malarial:

"NORTH CAROLINA BOARD OF HEALTH,
"RALEIGH, N. C., April 20, 1894.

"DEAR DOCTOR:—The evidence that malarial diseases are introduced into the system in many if not most instances through the medium of drinking water is, to my mind, conclusive. The water containing the germs or plasmodia is surface or superficial soil water. Those living in malarial districts who confine themselves to water from cisterns or wells driven or bored beneath the stratum of marl or impervious clay—in other words, beyond the water which soaks down from the surface—are to a large extent free from attacks. If the people of our eastern counties could be generally convinced of this fact, and thereby induced to act upon it, the health conditions of that really fine section would be revolutionized for the better. To bring this about is the object of the Board of Health. In order to do this facts must be presented to them in the concrete—not by illustrations from "Asia and Spasia and t'other side o' Hillsborough," so to speak, but by instances from among their own neighbors. I write to ask if you know any facts bearing on this subject and, if so, that you will write them to me in detail at your earliest convenience. Give the name and post-office of the head of the family having the experience. If not personally familiar with the facts send me the name and address that I may write him direct.

"Your kind and prompt attention will greatly oblige,

"Yours truly,

"RICHD H. LEWIS,
"*Secretary.*"

To this forty-two replies were received, seven of which, having no special bearing on the point at issue, have not been used. Not being satisfied entirely with the evidence thus obtained, and desiring particularly to have as far as possible specific, detailed statements of actual personal experience, I sent the following circular-letter to every one using cistern or driven well water whose address I could get:

"NORTH CAROLINA BOARD OF HEALTH,
"RALEIGH, N. C., August 1, 1894.

"MY DEAR SIR:—The State Board of Health is investigating the question of the introduction into the system of the malarial poison through

the medium of the drinking water. We believe that there is much evidence to prove that persons drinking water, from cisterns especially, and also from wells bored or driven below the impervious layer of clay or marl, are less subject to malarial diseases than those drinking from shallow wells.

"If this fact can be demonstrated upon 'homespun' evidence by a statement in detail of the experience of our own people, which would make a deeper impression than that from foreign parts, we hope by disseminating this evidence widely among the residents of the malarious regions of our State to so augment the use of the purer waters as to revolutionize their health records.

"We believe it can be done, but we must have a detailed statement of the evidence. For example, something after this sort: 'Up to ------ date my family used water from a well (describe well) and we had ------ cases of malarial disease (or our doctor's bill, for malarial diseases chiefly, was -----). Since that time we have been drinking cistern (or driven well) water, and the attacks of malaria (or doctor's bill) have been so and so.'

"Your name has been handed to the undersigned as one who has probably had such an experience. Will you not, in the interest of the health of your neighbors and the material prosperity of our State, *promptly* transmit it?—to

"Yours truly,

"RICH'D H. LEWIS,

"*Secretary.*"

To this thirty-seven replies were received.

In order to give a general idea of the drift of the letters from both sources I have classified them under the following heads:

	Medical.	Lay.
Favorable	10	22
Unfavorable	1	4
Indifferent, but generally favorable rather than otherwise	31	11

LETTERS FROM PHYSICIANS.

In order to save space the irrelevant portions of the letters following have been omitted:

Dr. Will J. Gilbert, Mill Prong, Robeson county:

"Your circular received. Very glad indeed to see the interest taken in drinking water as medium of malarial disease. I have been in the north-eastern portion of Robeson county for the last five years. First two years had much malarial trouble to treat; since then, up to present time, have had comparatively none, due entirely to the use of *driven wells*, ranging from twenty to thirty feet in depth. Among many instances

I could quote one family. Mr. Stephen Thrower's suffered greatly, his bill averaging high up, with narrow escape of his sick from death. I had to interdict the use of well water or to have the same boiled before marked improvement became noticeable. I pleaded with Mr. Thrower to get a driven well, and assured him of perfect immunity from future trouble and expense. He did so, and now, instead of monthly visits and big bills, I am never called save occasionally in trivial troubles. Again, Hon. D. P. McEachin's family experienced the same benefit, also the families of Hon. Ed. Purcell, Mr. T. I. McNeill, Mr. Natt McPhauls, Mr. Lige Gibson, Mr. J. B. Weatherby, and many others. One noticeable case few months back: Wife and children and father suffering from malarial ills near the Cumberland county line, medicines affording but temporary relief—cases chronic and otlice patients. Upon my first visit I visited his well, and found his water polluted by the nastiness of his yard, foul in smell, of bitter taste, and milky in color. I called Mr. Graham's attention to the source of his troubles. He had a driven well put in use at once, and to-day the sallow, dejected, woe-begone patients are bright, with buoyant spirits, good appetites, clear, healthy skin, under pure water and precious little physic. I venture the assertion that the driven wells in Robeson county have saved thousands of dollars and many lives since their introduction. One case near Fremont, Wayne county: Mr. M. T. Johnson before the driven wells had much malaria; since the use of water from his driven well no malarial troubles. I could give you much personal experience as practising physician of eighteen years in Eastern North Carolina and this section as to the marked benefit to health from change to drinking water from driven wells. Facts sustain your reasoning.

"One more case sustaining your reasoning: At the John Gilchrist place, in the county of Robeson, occupied in 1889 and 1890 by Mr. Archie McQueen, wife and seven children, malarial fever of malignant type prevailed; four of family sick; duration of attacks six to eight weeks; visits every day; every sanitary measure exercised; water from well boiled; patients recovered, to be taken again every fall; father not disposed to have a driven well, and the place finally abandoned. From the great amount of sickness of this family and the death of a Mr. McLeod, who moved in after the McQueens left, the place was looked upon as a grave-yard, and a party from South Carolina—one Mr. Quick—being offered the place at a low price, declined to purchase before consulting me as to the health surroundings. Mr. Quick, wife and one child now occupy the place, and enjoy freedom from malarial troubles by virtue of the driven well used at my suggestion. So it is all over this section. Where the driven well is used there is no sickness from malaria."

Dr. Samuel Morril, Farmville, Pitt county:

"Your circular of April 20th received. In the section of country I travel over open wells are the rule. Driven wells are now being used to some extent, with improvement of quality of water and general health. I have been urging this matter personally for some years. B. M. Lewis, P. O. Dongola, N. C., congratulated himself that the year after he bored a well his doctor's bill was less than it had been in years.

"John T. Barrett, Farmville, N. C., is, or was, enthusiastic on the subject of driven wells, and undoubtedly there has been less malarial trouble in his family.

"Sufficient time has not passed in other cases to prove anything—less than a year only since commencing their use."

Dr. W. W. Lowe, Wilmington, N. C.:

"In regard to your remarks on the production of malarial diseases from the use of surface water, which includes our shallow wells, as well as branch or ditch water, you are certainly correct. I have made many observations concerning this question during my past life, and have been long thoroughly convinced that surface water drinking plays a far greater part than climatic influence in causing malarial fever, as well as many of our hepatic troubles, including obstruction, jaundice, colic, congestion of the liver, etc."

Dr. J. F. Garrendon, Coinjock, Currituck county:

"I agree with you as to surface water, etc. I believe that three-fourths of the diseases in this low, flat country are produced by malarial poison, and most of it is taken into the system by drinking-water (surface water). I have a well or pump driven twenty-seven and one-half feet deep, and there are no malarial diseases in my family. Cisterns will not do unless they are perfectly tight, and no water exposed to the air in any open vessel or well in this country is fit to drink, for it will absorb malarial poison."

Dr. A. B. Pierce, Weldon, Halifax county:

"While I cannot call to mind any particular locality affected to any considerable extent by surface water as the cause of malarial diseases, yet I agree with you, and give it as my opinion, after an observation of fifty years, that surface water, as a drink, is the fruitful source of much of the malarial trouble of malarial districts. As an instance: In the region of country in the lower part of this county and the counties adjacent the wells are very shallow, and the drinking water must more or less partake of the surface water, as in a great many of the wells the water is but a few feet from the surface. It is my observation that regions of country thus situated are subject to a great extent to malarial troubles.

"As another instance of the opposite of this the wells in the section around Weldon are generally very deep, and but little or no surface water has an opportunity to vitiate the water. The wells are mostly bored or otherwise protected from the surface water. Since the town has been drained in the last twelve or fifteen years I suppose that we have as little malarial trouble as any section of North Carolina; and I attribute its exemption from malarial disease to cistern water, bored wells, and wells protected from the surface water."

Dr. Alphonso Fields, Aurora, Beaufort county:

"After an experience covering seven years I must say that I am of the same opinion as yourself respecting the development of all malarial troubles. Filtered rain-water, well-drained and well-*whitewashed* premises are in almost all cases sure malarial preventives."

Dr. Thomas M. White, Belvidere, Perquimans county:

"I am interested in the subject of which you write. The inhabitants of this little village abandoned their wells as the principal source of drinking water about ten years ago. The health of the inhabitants has materially improved since they have been using cistern water. If there was no other source from which they could get water the results would be more perfect, and I am sure better."

Dr. George N. Emett, Beaufort, Carteret county:

"Since the introduction in many localities of long-pipe driven wells malarial troubles have greatly diminished."

Dr. L. L. Staton, Tarboro, Edgecomb county:

"My attention has for years been in the direction of the supply of drinking water. A few years ago I came in possession of a farm with a mill-pond on it, and with the reputation usual to such localities of being very unhealthy. After owning it for a year I found that malaria abounded. I had all the open wells filled, and, there being several good springs on the place, the filling of the wells necessitated the use of the spring water. The malarial diseases were very much lessened, and continued to grow less from year to year, until the miller re-opened a well for his own convenience, but against orders, and but a short time after his very large family was sick from malaria. Upon refilling the well the malaria soon disappeared.

"In building a cotton oil mill on the place, so much impressed were the proprietors with the danger of malaria from open wells that a cistern was built. It has been my universal advice in practice to suggest a cistern, and next to that a driven pipe; and in all cases where the cistern has been built and kept in proper condition the malarial troubles have been greatly reduced, and, in some instances, entirely disappeared.

"At first the driven wells seem to have a beneficial effect, but after a while they are infected. My observation is that the neighboring farms have much more malaria than the farm alluded to. The amount paid for medical attention on the farm has been decreased at least one-half from former years, notwithstanding the number of laborers has been doubled.

"Good and properly prepared food and pure water will, in my opinion, effectually stamp out all malarial diseases in Eastern North Carolina."

Dr. W. H. L. Goodman, Franklin, Va.:

"I came to this place in 1865 and resumed the practice of medicine. I found malarial diseases very prevalent — in fact, from that time up to 1887 our people suffered greatly from chills and other malarial troubles. In 1887 the first artesian well was put down, from which we received a supply of excellent drinking water which at once took the place of the old surface wells, and a decided improvement in the health of the entire community was immediately noticeable. This well was followed by others, and we now have twenty-five in number, each averaging a flow of fifteen gallons per minute, or a grand total of over five hundred thousand gallons every twenty-four hours. Since 1887 the population of Franklin has doubled, and malarial troubles are almost entirely unknown. The general health of our town is excellent. Our wells average one hundred and forty feet in depth and the temperature of the water is 60°."

FROM OTHERS THAN PHYSICIANS — THOSE USING CISTERNS.

His Excellency, Governor Carr, Old Sparta, Edgecomb county:

"There is no question in my mind as to marked improvement in the health of those using cisterns over those using water from the open wells."

Hon. George H. Brown, Jr., Washington, Beaufort county:

"There has been a very marked improvement in the health of families using cisterns."

Mr. W. P. Baughan, Washington, Beaufort county:

"My family use cistern water altogether and we never have any sickness at all. I agree with you that the shallow well which takes the surface water does the work, and so few of them arranged to let rain-water drain off from them. I have known them to allow rain-water to run in and fill well. We never use a physician for sickness such as you name."

Mr. David Pender, Tarboro, Edgecomb county:

"In 1859 I built a comfortable home in Tarboro, and for eight years my family frequently had chills and fever. Dr. Pittman, our family physician, stated to me that the use of cistern water was the only cure

for our ills. I had a cistern made immediately and for more than fifteen years we had no fever whatever.

"Six years ago I rented my home to a large Jewish family, who have just informed me that they had no fever during the six years.

"We use cistern water in our store and not a single case of fever for years among our employees. I have boarded at Hotel Farrar for six years; we drink cistern water, and scarcely a case of fever in the hotel during the six years."

Mr. John F. Shackleford, Tarboro, Edgecombe county:

"At home we use cistern water entirely and have cistern thoroughly cleaned out every November and catch no water after March 30th. Have never had a case of malarial fever on the lot.

"At my mills we worked one hundred and twenty hands and used well and spring water and had a great many cases of typhoid fever and dysentery, so serious that I had a driven well, about ninety feet, put down and got good water, and the result was have had little or no sickness since."

Mr. L. Heilbroner, Tarboro, Edgecombe county:

"I have been a resident of this place since 1868; have resided in three different localities of the town, and prior to the fall of 1891 my family used drinking water from wells not over twenty feet deep. Up to 1891 we rarely escaped malaria and had three cases of typhoid fever, one of which terminated fatally. As a result my yearly doctors' bills were very heavy, as we had malaria every year. In the fall of 1891 I built a cistern, and I am happy to state since that time scarcely any member of my numerous family has had a chill and my doctors' bills from that source are comparatively nothing."

Hon. Kemp P. Battle, State University, Chapel Hill:

"In regard to the drinking water and malaria question, I am able to make the following contribution: The late Mr. Paul C. Cameron, an an observant and accurate man, and a very wise manager of slaves, told me that he and the Hon. John Y. Mason, of Virginia, bought adjoining plantations on the Mississippi river and removed many slaves to them from North Carolina and Virginia at the same time. He (Cameron) provided tanks and rain-water, while Mr. Mason did not. The result was that the Cameron negroes were as healthy as in North Carolina, while the Mason colony suffered greatly from malaria."

Mr. George A. Spencer, Washington, Beaufort county:

"Up to the year 1887 we used well water in our family—that is, we used it for about seven years previous to that time, and during that time we had four cases of typhoid fever in our family besides cases of malaria. Our doctor's bill during that time was near one thousand dollars. Since

that time we have been using cistern water, and our general health has been very *good* and our doctor's bills have been very *small*. The wells we used water from were surface wells. It is our opinion that the water we used at that time had a great deal to do with our health."

Mr. J. B. Whitehurst, Aurora, Beaufort county:

"Up to March, 1890, my family used well water, and my doctor's bill was from $60 to $130 per year. Since March, 1890, we have used cistern water. I have not paid $50 doctor's bill in three and one-half years. I lost three children up to 1890, and I carried my family to the sea-coast. Since 1890 my family has remained at home and had no need to go off for health. Encourage all to have cisterns. I speak from experience."

Mr. J. A. Perry, Scotland Neck, Halifax county:

"I have long since been satisfied in my own mind that more malarial poison is taken into the system in drinking water than in any other way. It was fully demonstrated during five years' residence in Beaufort county in this State. I bought a farm in Beaufort county, on the Pamlico river, about two miles below Bath creek. There were three wells on the place from which water was used by the occupants for all purposes. The wells were about ten feet deep. After taking possession of the place I learned from the neighbors that it was considered a very sickly place, and that the family which occupied it the year before (1869) lost five children during that year (which statement was correct) from fever. I had a good cistern built before I took my family there, which was in November, 1870. I carried my wife and four children there, lived there until January, 1876, when I left with six children and wife, all in good health. We had no serious sickness while there, and my doctor's bills did not average $10 per year, exclusive of midwifery fees (having two children born there). There was one death only during the five years, and that was a negro woman, who died of consumption. Besides my white family there were about twenty negro hands on the place, all of whom I required to use water for drinking and cooking from the cistern, which was a very large one. My neighbors had as much sickness as they had had before I went there, and it was constantly remarked by them that I had no sickness on my place.

"I have frequently heard Drs. McDonald and Taylor (both now dead) say that just after the war, in their practice in Washington, Beaufort county, when the citizens began to build cisterns the doctors' bills in the families who used cistern water decreased very much, and was very decided as soon as a family would make the change. I have heard Dr. John Blount, of Washington, who is now living, make the same statement."

Hon. W. D. Pruden, Edenton, Chowan county:

"My experience and observation have been most satisfactory and convincing of the good effect of cisterns upon the health of those who use them here. Prior to 1883 my family used water from an open well in my yard, which was carefully looked after, and was certainly equal to any other in the community. In 1883 I built a cistern, and we have constantly used water from it since, and I am satisfied that sickness in my family has been reduced one-half. There is no other cause for it known to me except the change in water. Malarial sickness with us now is rare. My neighbors who have used cistern water have, I believe, had a like experience. Cisterns have largely increased in our town, and the health of our people correspondingly improved.

"Many of our people use driven wells, which are also beneficial, though not as much so, I think, as cisterns. The pipe is small and largely excludes surface water."

Mr. I. M. Thompson, Southport, Brunswick county:

"I have been living in my present quarters thirty years, and have used cistern water, and have never had a case of fever in my family of nine grown children, while those in the house twenty feet from mine, and others on the same block, using pump water from pipes running down ten or fifteen feet, have attacks of malarial fever every summer. I was married to my present wife seven years ago. She weighed one hundred and twenty pounds, had always drunk shallow well or pump water, and was full of malaria, which developed into a case of fever soon after she came here. Since her system was cleared and she has been drinking cistern water she is perfectly healthy and weighs one hundred and seventy pounds.

"There are only four cisterns in this town, and to my knowledge there has never been a case of fever in any of the houses where they are. I am delighted that you are agitating the question, have always been interested in it, and hope your 'efforts to revolutionize the health records' will meet with success."

THOSE USING DRIVEN WELLS.

Hon. Thomas G. Skinner, Hertford, Perquimans county:

"I used spring and well water in my family up to the year 1887, and my medical account was large every year. Since then I have used water from a driven pump—forty-five feet deep—and we have no fever, and my doctor's bill is only nominal."

Mr. C. W. Morgan, Hertford, Perquimans county:

"I have been using water in my family from a driven pump thirty-eight feet under ground for nearly five years, and during that time we

have had no malaria or chills in our family. I think the driven pump excellent for health in this malarial section."

Mr. Timothy Morgan, Hertford, Perquimans county:

"When driven pumps were first introduced into this section they proved a perfect failure, because no one thought of driving more than ten feet, and seldom that far. Of course that gave us the same water that our wells afforded, and, besides, the excavation made at the bottom of the pipe was constantly caving in and keeping water always muddy. I had always used well or spring water up to that time, and while I was very anxious to have a pump I saw no improvement save convenience. I therefore continued to use well water. I do not remember the exact time when I had my pump driven, nor could I give you any definite figure as to doctors' bills up to purchase of pump, but this I do know, that since I have been using it we have had little or no malarial sickness, and we prefer the water to any attainable here. I think I have been using pump about eight years. It is forty-seven feet deep. I would not be without it for ten times its cost."

Mr. M. H. White, Hertford, Perquimans county:

"In my opinion the driven wells have done more to benefit the health of this community than anything I have ever known."

Mr. George D. Newby, Hertford, Perquimans county:

"We have been using the driven wells about eight years, and think they have improved the health of this place (Hertford) at least 50 per cent. Before that time we used wells about eight or ten feet deep."

Mr. L. W. McMullan, Hertford, Perquimans county:

"From 1865 to 1884 I used water from surface wells from nine to twelve feet deep. My doctor's bill for that period averaged $100 per annum, mostly for malarial diseases. Since 1884 I have been using water from driven pump—forty-five feet deep—and during the ten years my doctor's bill has been less than $20 average per annum, and very little of that amount has been on account of sickness from malarial causes. It is exceedingly rare that any of my family (wife and four children) have had chills and fever since 1884. Before that time every member of the family had chills and fever often. I believe our improved health is due entirely to purer water."

Mr. Joseph White, Winfall, Perquimans county:

"We have used the driven well or pump in our town for five years, and since its use have realized a great *improvement in the health* of our town. I remember the year before I began the use of water from the pump, which is seventy-three feet deep, my doctor's bill was $100; since then, for four years, my medical bills have averaged from $15 to $20 per

year, and but little of this expense accrued from malarial influence. I feel confident my pump—the use of its water—has saved me $150 in the last four years. All the doctors heartily recommend them."

Mr. Henry S. Bunn, Dochead, Edgecombe county:

"I have lived at my present home about twenty years, drinking water from a common well curbed with cypress gum to the depth of eighteen or twenty feet. This being a malarial country, chills were no strangers to us; but last winter and spring they came with unusual frequency and severity. I became suspicious of my well, and on June 8th last I put down a common iron pump, and since that time don't think we have had a regular malarial chill. Certain it is that there has been not to exceed forty grains of quinine taken by us from June 8th to date (August 26th), but for five months prior to that time we used one ounce of quinine a week. I think the change entirely due to the healthfulness of the water. The pump is invaluable in this section."

Mr. S. E. Thrower, Melrose, Robeson county:

"I have been here about twelve years, and had a well that I thought was good water, and my doctor's bill ranged from $10 to $25 every year. Our family doctor said the water was not good. I thought he was mistaken, but he told me to get a pump. I got one and drove it down thirteen years ago, and have not had a doctor since for malarial poison. I think a pump is the greatest thing on earth. Dr. W. J. Gilbert is the man that recommended the pump."

Mr. C. A. Holland, Maxton, Richmond County:

"Your circular-letter of August 1st received. I have been in the pump business here for eight years. Before the people began using pumps there was a great deal of chill and fever, but now since their introduction we rarely ever have a case of chill and fever. Dr. McNatt told me some time ago that in a section of country between here and Lumberton, where they had so much malaria several years ago, he rarely ever has a case, and he says he has no doubt it is the use of pumps that has caused the improvement in the health of this section. The doctors in this section all recommend pumps in preference to open wells."

FROM PHYSICIANS—UNFAVORABLE.

Dr. J. F. Miller, Superintendent Eastern Hospital, Goldsboro, N. C.:

"I, in common with many physicians, have held to your theory on the water question; but recently some experiences have upset or rather disagreed with my theory. For a year we have had a great deal of malarial fever, mostly of intermittent and remittent types, and I find those who use cistern water suffer about as much as those who drink well water. Our wells are, however, driven wells and not dug-out wells. Our well water

was analyzed by Dr. Venable, of Chapel Hill, and pronounced O. K. It may be that we have malaria in spite of good water from all our sources, and this supports our theory to some extent. The lowlands bordering on Little and Neuse rivers are prolific in malarial fevers during most of our fall months; and the past August, September, October and November we had in this hospital among patients and their employees and their families nearly two hundred cases, many of them relapses; but from this cause we had no deaths."

FROM OTHERS THAN PHYSICIANS—UNFAVORABLE.

H. Wiswall, Winshadrille, Beaufort county:

"We have used cistern water and sometimes water from driven wells, never from the other wells. I cannot say that we have escaped the chills, but I do think that we have fared much better than others who use poorer water."

W. H. Johnston, Esq., Tarboro, Edgecombe county:

"Up to the time I attained the age of forty-three years I used water from ordinary wells, and since that time have used cistern water. I greatly prefer cistern water to the water we obtain from wells, and am sure it is more wholesome, but I suffered no more from malaria when I used well water. I was married at thirty-seven years of age, and my family used well water for six years and have since then used cistern water. I am now sixty-three years old. I cannot say that my doctor's bills for malarial diseases were greater when we used well water than when we used cistern water. I think they were about the same."

Mr. Frank E. Hitch, Hamilton, Martin county:

"I have lived in Bertie and Martin counties for more than twelve years, in close proximity to Roanoke river. I have a wife and five children. In that time there has been but one chill in my family. I had that at Nag's Head last summer. We have drunk well water all the time. No other family in this section has such a record as mine."

Mr. J. B. Bryan, Aurora, Beaufort county:

"Would say that cisterns are cheap and appreciated by our people. Am sorry to say that I am not certain that they add to the health of our people, but think they must."

In assigning to the evidence just cited its proper weight I am not unmindful that the conditions demanded by rigid scientific accuracy were not always present, but most of the letters are so clear, definite and positive as to be, to my mind, taken in connection with the evidence cited from other writers, absolutely conclusive of the fact that the malarial poison finds its way into the system largely—not to express it

too strongly—through the medium of drinking water consisting solely of, or contaminated by, surface washings, or chiefly of superficial soil water. It is to be noted that water from *deep*, open wells, where the surface water had to percolate a long distance—where it was thoroughly filtered—was comparatively innocuous (see letter of Dr. Pierce). It is stated by a writer on this subject (Dr. Bartley, cited above) that he has demonstrated this fact with a Pasteur-Chamberland filter; and it is well known that enough of the right sort of mother earth is one of the best of all filters. I would also call special attention to the fact, as clearly shown by the evidence given, that there is no special virtue in a driven well *per se* beyond keeping out the surface washings, but that it is the *depth* to which it is driven that confers the virtue. Note the difference in the results obtained from the shallow-driven wells of Southport and Pensacola, Fla., not to mention others, and the deep-driven wells of Perquimans and the deep-bored wells of Franklin, Va., and south-west Georgia.

In order, if possible, to have this question of the part played by drinking water in the production of malarial diseases investigated on a large scale, with all the conditions necessary for scientific accuracy strictly complied with, I addressed the following letter to the able Superintendent of the Penitentiary, the Hon. A. Leazar:

"RALEIGH, N. C., May 5, 1894.

"*Hon. A. Leazar, Superintendent of State Prison, Raleigh, N. C.,*

"MY DEAR SIR:—Remembering the interest in the subject of the influence of drinking water in the causation of malarial diseases shown by you in our recent conversations on that line, I enclose a copy of a circular-letter which I have sent to every physician in the eastern part of our State. From the replies to it I hope to obtain ample evidence of such convincing character as to bring about good results.

"If you and your Board of Directors can see your way clear to undertake it, I am sure you can be of great help in making this investigation that the State Board of Health has begun. The fact that one of the State farms is very malarial, and the further fact that the population resident thereon, being prisoners, are under absolute control, combine to make conditions exceptionally favorable to reliable and trustworthy experimentation, which can, by no possibility, do any harm, but may be productive of the greatest good, not only to the convicts themselves directly, but indirectly to the people of a large part of our State. If you find that you can undertake the experiment, I would respectfully suggest:

"1. That you build a cistern for the collection of rain-water, and that you bore a well deep enough to get its water supply from beneath the stratum of impervious marl or clay.

"That the prisoners may be divided, as equally as may be practicable and convenient, into three squads. That each squad, being as far as pos-

sible under exactly the same conditions in other respects as the other two, be absolutely restricted to the use of one kind of water—the ordinary water now in use, the cistern, and the deep well-water, respectively.

"3. That if it be not already a routine practice—as it probably is—a full and accurate record of disease—malaria particularly—be kept from now on, in order to create a basis of comparison with a similar record after the change in drinking water.

"Bespeaking on the part of yourself and your Board of Directors a careful consideration of this matter, I am,

"Very truly yours,

"RICH'D H. LEWIS,

"*Secretary.*"

To this the following reply was received:

"NORTH CAROLINA STATE PENITENTIARY,

"RALEIGH, N. C., May 8, 1894.

"*Dr. R. H. Lewis,*

"MY DEAR SIR:—Yours of recent date, suggesting experiments by the Penitentiary of cistern and deep well water, for the better sanitation of our convict camps, is received and duly considered.

"I hope soon, by the assistance of Dr. Holmes, State Geologist, to make some exploration as to the possibility of getting the deep water, and then, if successful, to adopt whatever plan seems most practicable and to promise the best results.

"I will refer your letter to the Board, which meets May 21st, for their consideration.

"With great respect, I am

"Yours truly,

"A. LEAZAR."

I also had a personal interview with Mr. A. B. Young, the energetic President of the Board. He showed much interest in the matter and promised to see what could be done.

Learning that driven wells had been tried on the State farms in Halifax, I wrote, enclosing circular-letter No. 2, to Drs. George H. West and H. B. Furgerson, physicians to the farms. Only one reply has been received, I regret to say, so far, and that not so full and detailed as it will be in the near future, as appears in the letter itself. It is quite instructive, however, as it is, and we may look forward with much interest to Dr. West's promised paper. The letter is as follows:

"WELDON, N. C., September 6, 1894.

"*Richard H. Lewis, M. D., Raleigh, N. C.,*

"MY DEAR DOCTOR:—Yours of the 5th to hand, and in reply would say that I am preparing an article for publication for the *North Carolina Medical Journal*, entitled 'Good Drinking Water *versus* Malaria,' but

will not have it ready before October, as I want to include in my observations the month of September, as August and September are the unhealthiest months on Roanoke river; but I can give you a practical illustration of the result of using water from driven pumps for August. There has been an average of sixty-five hands (greatest number eighty) working on the dyke on the Roanoke river on Northampton State Farm, and I have had them to use exclusively water taken to them from the quarters two miles distant (driven pump), and during the entire month there was not a *single case* of intermittent fever among the force. This I consider the most unhealthy situation on the entire farm, and, to use an old Louisiana expression, the 'malaria is such that you can stir it with a stick or cut it with a knife.' During my twenty-three years' experience in the active practice of medicine, including a residence of six years on Red river, in northern Louisiana, I have been a great stickler for good drinking water, and I think the day is not far distant when the malarial dilemma will be solved by working up a public sentiment in favor of the use of good drinking water. I am fully aware that one swallow does not make a summer, but I am greatly encouraged in the line of work I am pursuing during my four months' residence as physician to State farms. If you wish I will contribute the article I have reference to to the *Bulletin*.

"Yours very truly,

"GEORGE H. WEST."

I am very much in hopes that the authorities of the Penitentiary may carry out in detail, on one of its farms at least, the experiment suggested in my letter to Superintendent Leazar. It would be extremely valuable and carry great weight in the scientific world.

While this investigation is not yet concluded, I believe the reader will agree with me that the case is practically made out, and that we may claim with certainty that the malarial poison finds its way into the human system through the medium of drinking water, and that in all probability it constitutes its principal avenue of access. Q. E. D.

Excluding malarial diseases, there is, in my deliberate opinion, no healthier country on earth than Eastern North Carolina. If the universal employment of pure drinking water in that section could be brought about, its health record would indeed be revolutionized, and that really splendid country would blossom as the rose.

POSTSCRIPT.

Since the above was published that admirable journal, the *Charleston News and Courier* has interested itself actively in the investigation of this question. Besides publishing most of the letters given above the editor

has printed, with able comments on the same, a number from persons living in the malarious section of South Carolina. Some of them are so striking and so convincing that we feel that any one who has been interested enough to read this far will thank us for the opportunity of perusing them also. We therefore append pertinent extracts and desire to call attention especially to the letters of Mr. Emerson and Dr. Wilson.

[From Mr. J. R. Randall.]

* * * Yesterday I had an interview with Mr. Henry Yeatman, who, for a considerable period, resided in Princess Anne county, Virginia. The conditions there are just such as exist in your low country. Mr. Yeatman substantially said: "How many years of suffering I would have escaped had I known or had I become convinced, as I am now, that the fevers that scourged our country were produced by the surface well water and not by the atmosphere, as nearly everybody believed, including the doctors. I well remember how, more than forty years ago, the Rev. Mr. Gatewood, then a young man, was pitied for accepting a clerical charge in our afflicted community. He was a fearless man and confidently predicted that he would not get the prevailing diseases. Year after year he remained among us and was totally exempt from our maladies. Every year people shook their heads and said: "He has escaped this time, but wait until next year. He is bound to get fever, chills and chronic dysentery, like the rest of us." None of these ominous prophecies were fulfilled. At last some of the neighbors waited on him and asked him to tell them how he managed to keep perfectly well. He laughingly said: "I do not dring water. Neither do I drink any spirituous or malt liquors. I eat indiscriminately whatever I please—the same fare as yourselves. I drink coffee and tea, but never touch water." Of course he meant raw water, for he boiled it with his tea and coffee. To this day Mr. Gatewood, now an old man, abstains from raw water, and is a model of health. In the immediate vicinity of our swamps the people dwelling there knew that their shallow wells were dangerous. In every house a pot of water was always kept boiling in the fireplace. The people there made a kind of Yupon tea and drank of nothing else. They never had any fevers or consequential diseases. I see now that the boiled water alone, without the boiled Yupon ingredient, would have sufficed. I do not see how any man, with these and other kindred facts before him, can doubt for a moment that malaqua and not malaria is the bearer of zymotic disease.

[From "Med."]

This water question is understood and appreciated by all the inhabitants throughout this notoriously malarial region, for go wherever you will and ask if they have fever, and the invariable reply will be "Not much, or no, for we have good water," or "Yes, you see the water is not good."

A few years since, within the last five, the residents in and around Honey Hill in Berkeley county have adopted the use of driven wells in lieu of open wells eight or ten feet in depth, poor substitutes, you will admit, for artesian wells or cisterns. Although these pipes are driven only sixteen to eighteen feet, still the result is striking in the decrease of malarial diseases. At one locality, about three miles from the above mentioned village, at one time considered a "death hole," and from which a family "natives to the soil" had removed, another family, almost entirely strangers, had lived with comparative impunity for the last four years, using only water from a driven well. How much more effective would be perfectly pure water? I have no hesitation in saying that, irrespective of locality, the health of the residents is in direct ratio to the quality of the water. In rainy seasons the wells are generally filled with surface water, hence in such seasons we always have more fever hereabout; in dry seasons comparatively little. "MED."

ST. JAMES SANTEE, S. C., February 2, 1895.

[From X. Y. Z.]

* * * Prior to the use of artesian and cistern water the white employees of these mines were frequent victims of malaria in its various forms, whether sleeping at the neighboring pine land or at the health-giving resort, Summerville, and notwithstanding the use of quinine.

Since the building of cisterns and the boring of wells about 375 feet deep, and the exclusive use of those waters, the same individuals who before suffered have been exempted from malarial troubles, even those most exposed to such influences, superintending the digging of rock in rain or heat or cold.

I have had but one attack of fever in nine years and that resulted from getting wet in a summer storm while crossing the river, and having to remain in the wet clothing until I reached the city. I always avoided the use of spring or surface water, going without or using milk as a pleasant substitute when to be had, until cistern water was available. We have hunted here in August (the "stands" in dense swamps), early in the morning before the dew and mists had been dissipated by the sun, and escaped fever, shunning surface water.

So convinced are we all here of the benefit arising from the exclusive use of cistern or artesian water that a bottle of one or the other is carried on every hunt, even though a flask of something stronger accompanies it "to keep off snake bites." One young gentleman has slept at these mines the entire summer without suffering from malaria, and he not a stranger to the low country, nor yet acclimated to swampy regions.

The physicians and scientists may draw their own conclusions; I have no theories to advance, simply state facts. X. Y. Z.

Of course in the above I refer to serious attacks of fever.

MAGNOLIA MINES, ASHLEY RIVER, February 1, 1895.

[From C. J. M.]

TO THE EDITOR OF THE NEWS AND COURIER:—I have been reading with much interest the articles which have appeared lately in the *News and Courier* on the subject of drinking water and malaria. My experience with driven pumps in the river bottoms may be of interest.

In 1884 I bought a river place to go into the stock business, and as it was necessary to be on the place I moved into the swamp. My friends all advised against it and predicted that I would not be able to live there. I put down a driven pump twenty-five or thirty feet and for five years lived on the place, winter and summer, and enjoyed the very best of health the whole time, and now my friends say that I have exploded the idea of river bottoms being unhealthy. It is impossible to get pure water from a well anywhere, but particularly in the swamps; but with driven pumps it can be obtained in any locality, and that renders the bottom lands of the Pee Dee river perfectly healthy. * * * C. J. M.

MONT CLARE, S. C., February 7, 1895.

From Mr. Emerson.]

* * * We have lying around us a rich and fertile country which is practically uninhabited. Why? Simply because the cry is, "Do not go into the country; if you do you will die of country fever!" The result is that strangers coming into the city do not dare be caught outside its limits after sundown for fear of catching some dreadful disease that will kill them in a few hours or days. During the last four years I have spent quite a number of nights traveling all night through the swamps and sickly sections of Berkeley county during the months of June, July, August and September for the purpose of deciding the question in my own mind whether the air had anything to do with the fever or not. Others have tried the experiment with me and none of them have had any symptoms of malaria. Not only myself and wife, but my brother and his wife and two children have slept all through the summer months with all windows open, and a free circulation of air passing through our sleeping apartments. I have exposed myself to all kinds of weather, have been out before day in the bushes and tall grasses, and have been soaked through from dews every morning during the hot season. I have had my Northern friends spend from a week to two months with me during the hot season, and in no case have they shown any symptoms of malaria.

As regards the air arising from the swamps one of "S's" so-called healthy places is nearer to swamps and stagnant water than my place is. I would not for the whole of Berkeley county spend a summer in any one of the places he mentioned and drink the surface water there. A look at the residents is sufficient. It is easy to see that the germ is doing its work, not to such an extent as it would if they lived on the plantation, because

the quality of the surface water in the pine land is superior to the quality of the surface water that they would get on the plantation. The soils of pine lands being of a sandy nature, the water filters through it and partially purifies itself before reaching the wells, whereas the plantation soil is of a clayey nature, and the water does not so readily penetrate it. It washes, therefore, directly into the well, carrying with it all the germs it has gathered on its course. The drier the season the more healthy the pine land. This comes from the water being better in the dry season than it is in the wet season. After the cyclone and the heavy rains following in August of 1893, and again after the heavy rains in September, last year, I visited one of these pine land "summer resorts," and found the wells all full and overflowing, with almost every resident down with malarial fever.

No city has ever experienced permanent prosperity that did not have a healthy and prosperous country surrounding it. It is not my purpose to criticise or condemn any person or place, but to do all in my power to help to build up the country, and I feel that I cannot accomplish my purpose by crying "wolf."

At a public meeting held at Entawville a few days ago I offered to give $5,000 to any man that would prove that a case of fever had originated on my place during my stay there of the last four years. An objection was raised that I might say the person had drunk water obtained elsewhere. I then offered and I now repeat the offer to give $5,000 to any man, who has no malaria in his system, who will come to my place and spend six months, or ten years, if he develops malarial fever, provided he drinks no surface water.

I am honest in my conviction. I have tested it until I am thoroughly satisfied myself. Now I am willing to spend more money and time, and to help in any way possible to assist in settling the question to the satisfaction of honest doubters to silence those who seem to be happiest when they are crying loudest against their own country.

I am a strong believer in the South; it is my adopted home; my interests are here. During the time I have spent here I have induced a large amount of capital to invest here and expect to induce a great deal more, but it is not my purpose to deceive or mislead any one. I am willing, therefore, to join hands with my opponents on this issue, and secure the best qualified and equipped men for the purpose and have them come into our country and make a thorough test and experiment and settle the whole question.

It is a question of vital importance to us all and we should have it settled right away, and so undo the injury that has been done to this region in the past. If it can be proved that the country is absolutely healthy and that "malarial fever" can be avoided by drinking pure water and pure milk and paying proper attention to the sanitary conditions of their sur-

roundings, we should prove it. With these facts established, as I am thoroughly convinced they will be established, a movement could be put on foot to bring into Berkeley county in the next two years twenty thousand good, thrifty, intelligent, industrious farmers, who would produce vegetables enough to run a hundred canning factories; potatoes enough to run as many more starch factories.

I have traveled the United States all over, have made an investigation of the matter, and believe there is no better soil and no better climate than we have here; and no better country provided we can keep ghosts from appearing to us at every turn.

Are we to continue to travel the road we are now on, which is a deplorable one indeed, or will we seek to leave it and take the road to prosperity and success? I for one have not the time or disposition to linger longer in the old one, but am determined to seek and find the new one. Who will go with me?

A. S. EMERSON.

CHARLESTON, January 29, 1895.

[From Dr. Wilson.]

JORDAN, CLARENDON COUNTY, February 11, 1895.

TO THE EDITOR OF THE NEWS AND COURIER:—I have read with a good deal of interest the discussion on "Malaria or Malaqua," and will give you the benefit of my experience the past summer and fall.

My work is on the Santee, and I had a great deal of intermittents. I found that when I required my patients to boil the water they drank I relieved them promptly of chills; otherwise the cases were extremely obstinate.

The excessive rains caused large quantities of water to lie on the low places. I drank water from a well and continued to have the chills in spite of the most powerful anti-malarial remedies known to materia medica. I drove a pump and stopped all medicines and had no more chills.

This naturally makes me a strong advocate of the water theory.

Yours respectfully,

H. L. WILSON, M. D.

No comment (says the editor) that we could make would add to the force of this testimony. Dr. Wilson, it is seen, goes farther than any one else who has testified on the subject, in that he testifies that he has *cured* chills in his own case by simply substituting good water for bad. He drank surface water, and took the most powerful anti-malarial remedies known, and "continued to have chills." He "drove a pump," "stopped *all* medicine," and "had no more chills." It would be hard to put evidence and argument in any stronger form than *that*.

ADDENDUM.

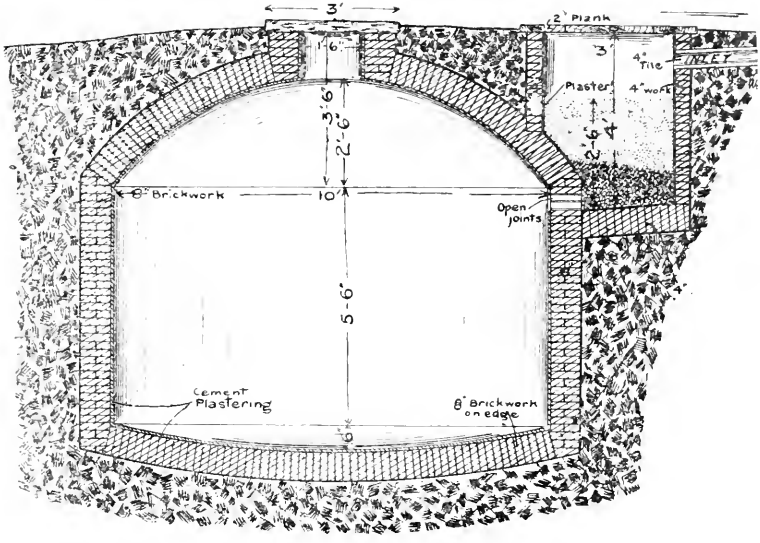
SUGGESTIONS AND INSTRUCTIONS FOR BUILDING CISTERNS FOR THE STORAGE OF RAIN-WATER.

BY J. C. CHASE, ENGINEER OF THE BOARD.

The most satisfactory form for an underground cistern for storing rain-water is circular in plan, covered with a dome arch ten or twelve feet in diameter and of the required depth to store the desired quantity. The smallest size that is usually constructed contains one hundred barrels, or thirty-one hundred gallons. This quantity would furnish an average daily supply of fifteen gallons for a period of six months. It is considered advisable to have the cistern full by April 1st, and have it of sufficient capacity to last till the fall rains set in; therefore the size will depend upon the prospective consumption, whether it is used merely to store water for drinking and cooking or is expected to furnish a supply for general uses about the premises, such as washing, watering stock, etc. In the latter case it would be better to provide two cisterns—one of which could be used for storage as the rains occurred and the other be reserved for household use.

The method of construction is shown in the accompanying drawing, and little additional explanation will be necessary. Care should be taken that the bottom be built on compact material, also that the earth is thoroughly packed around the outside of the structure. If built in hard material, such as stiff, dry clay, it may be practicable to make the excavation just enough larger to allow for a course of hydraulic cement mortar between the brick-work and the earth. The brick may be laid in lime mortar, but in that case it will be necessary to thoroughly plaster the structure both outside and in with a good coating of hydraulic cement mortar. The inside should be well and smoothly plastered in any event. The mortar for plastering should be made of pure cement.

The supply pipe from the roof should have the customary valve (Fig. 3) for wasting the rain-fall until the roof is thoroughly washed, and also after the cistern is full. The water should also be filtered through sand and gravel, from which the loam has been washed out, or charcoal, or a mixture of all three, before passing into the cistern. The same general method should be followed in constructing the filter as has been detailed for the cistern. The filter should be thoroughly cleaned out and the material washed each year. It is also desirable to clean the cistern, but



Sectional Elevation

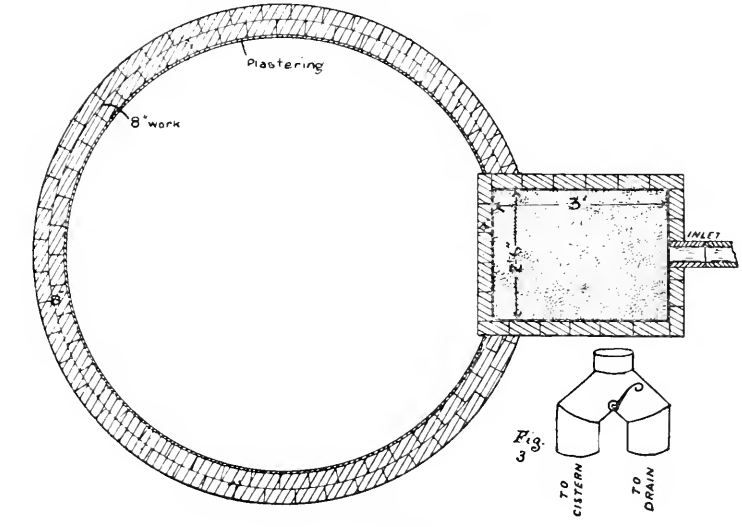


Fig. 3

Sectional Plan.

if the filter has proper care it will not be essential to do it each year. Care should be taken to close all apertures in the cistern in such a manner that vermin, ground water leachings, or any other impurities will be positively excluded. The roots of certain kinds of trees have a great propensity to seek water, and will find their way through brick-work if there is the smallest crevice to give them a chance to force an entrance.

Cisterns are sometimes built partially or wholly above ground; also rectangular in form with vertical sides and covered with a circular arch. The filter is also frequently built above ground and at a distance from the cistern, the water being conducted thereto in a duct made of brick or by iron or earthen pipe. Great care should be taken in laying this conduit to see that the joints are made perfectly tight.

Chain pumps are frequently used for drawing water from cisterns and have the advantage of thoroughly aerating the water, but as they are necessarily placed directly over the cistern and require a large opening to be made the danger of contamination from foreign substances getting into the water is greatly increased.

The following is a fair estimate of the cost of a cistern of the size shown on the plan, where the prices of materials are the same as those quoted:

Three and one-half thousand bricks	at $8.00	$28 00
Four barrels lime	at 1.25	5 00
Three barrels cement	at 3.00	9 00
Labor excavating, bricklaying, preparing filter with covers, etc		30 00
Total		$72 00

The cost of larger ones would be somewhat less in proportion to the size.

After this paper had been read, Dr. Bahnson said: "Following out the plan outlined this morning, I will say that this is a perfectly informal meeting, and we would be glad to have all participate in it, and to ask any questions that you feel disposed to ask."

Gentleman in the audience: "Mr. Chairman, I have observed that you all seem to believe that malaria gets into your system through water. Now, in my county here there are a large number of citizens who believe that it is necessary for you to put something into your system to keep the malaria out. You know that we are afflicted with a large

number of distilleries here, and I would like to have the Board tell us whether alcohol used moderately or immoderately will put the system into a condition that makes it easy to take malaria or not."

Dr. Battle: "There was a very interesting experiment tried in India some years ago. A regiment of soldiers going through the same campaign was divided into four companies, with a view to telling the effect of the grog ration upon the system; not only grog, but with a view to telling how coffee and tea and water affected the human system. One part of the regiment was put on pure water; a second was put on tea; a third on coffee, and a fourth was put on an alcohol ration. It was not a very fair experiment in some respects, as India is such a very unhealthy country, but the water quarter came out last; the tea people came out first; the coffee people came out second, and the alcohol people came out third. That is to say, tea gave the best results, coffee gave the second best, alcohol gave the third best, and water gave the poorest results. There is little doubt in my mind that a moderate amount of coffee and a moderate amount of tea and a moderate amount of alcohol does tend to protect the system against malarial poison. Of course the trouble is in putting on the brakes. The people in the tropics who take their coffee in the morning are less liable to take the malaria than those who just use the water. If we keep the veins full of good stimulant we are less liable to open wide the door to any malaria. Well, that about answers the question so far as I know."

Dr. Bahnson: "The question is asked whether it is possible to take malaria from ice gathered from ponds where malaria exists. It is not only possible, but it is certain."

Gentleman in the audience: "A day or two ago I saw something in the paper that was very amazing to me: that water after standing several hours was more wholesome

than if it was freshly drawn. I would like to hear some explanation of that."

Dr. Thomas: "One of the things that is always understood in regard to the water supplies of cities is that the water should not only be filtered, but that sufficient time should be given for sedimentation, so that all coarser particles, I mean those that can be seen without the microscope, will have time to settle."

Gentleman in the audience: "I would like to ask Dr. Battle whether the fact that the tea and coffee were boiled did not have something to do with the difference, and also whether the water was boiled or not?"

Dr. Battle: "I don't remember that the water was boiled, but of course the tea and coffee were boiled, but I think that tea and coffee are both very healthy, when taken in moderation. There is hardly a doubt but that the bulk of humanity is benefited by the use of tea and coffee. Of course it is the abuse that brings about the nervous disorders, just as it is with alcohol. I think the experience with alcohol has shown that the human frame cannot stand over one ounce of alcohol a day without injury. But as I have said about the tea and coffee, certainly those people who take in the morning that form of beverage have better health and are less liable to malarial influences."

Gentleman in the audience: "Mr. Chairman, I would like to know if you can give us a simple remedy for testing the water in our wells. It is a recognized fact that some wells have water as clear as a crystal, and as cold as ice, and yet the water is impure. Now we would like to have some means of testing the water in our wells to see whether it is pure or not."

Dr. Bahnson: "You can't tell that by any ordinary means, because the water may taste bad and smell bad, and yet the worst tasting and smelling water may be perfectly harmless as far as we are concerned."

Gentleman in the audience: "In 1872, in Memphis, there was a certain man whose duty it was to go all over the city and order all the wells cleaned out. He would go around and get a bottle full of the water, test it, and the next morning he would tell the owner of that well whether he must have his well cleaned out or not."

Dr. Bahnson: "The next paper on the programme was to have been read by Dr. Venable. We are sorry to say that Dr. Venable was prevented from attending on account of sickness in his family. The subject of his paper was 'The Pollution of Drinking Water and its Detection,' and therefore we will have to substitute the following paper entitled 'Household Water Supply,' by Mr. J. C. Chase, the Engineer of the Board, also unavoidably absent. Dr. Thomas will please read it":

HOUSEHOLD WATER SUPPLY.

BY J. C. CHASE, WILMINGTON, SANITARY ENGINEER OF THE BOARD.

The importance of an ample supply of wholesome water for general use is so universally understood and admitted that it may seem a waste of time to dwell upon the subject. It is corroborated by the fact that, at the present time, none but the smallest cities are lacking a public water supply. Less than a generation ago the largest city of our State had hardly dreamed of water-works, while to-day no less than fourteen municipalities have public water supplies, satisfactory, perhaps, in point of capacity, but some of them of more or less doubtful quality when the question of purity is considered. In using the term *pure* I do not wish to be understood as saying that absolutely *pure* water is desired or expected. Such water, if in existence at all, can be found only in the laboratory of the chemist, and its use would be impracticable even if it was considered essential. A standard of purity has, however, been established for the information of those interested in such matters, and the guidance of those who are intrusted with the selection of sources of supply. The sensible requirements of potable water are that it should be colorless, odorless and tasteless.

A plentiful supply of wholesome water for the household is a vital necessity. It should be *soft*, on account of its being better adapted for lavatory purposes, as well as for economic reasons; the difference in the amount of

soap required by a hard water, as compared with a soft one, is no inconsiderable item in the ordinary household expenditure.

Wells and springs are the most common source of supply for the household in the majority of places. Such waters are generally of a fair degree of purity. They are naturally inclined to be hard on account of taking up a certain amount of mineral matter from the earth, but if the well is deep and at a considerable distance from the dwelling, with the surface drainage from the well towards the house rather than the opposite, it may be safe to assume that the well will be reasonably free from organic contamination, or the specific germ of disease. With the ordinary shallow well, in porous soil, and in close proximity to dwellings or farm buildings, it is more than likely that the water derived therefrom is totally unfit for domestic use. It may be palatable, for even sewage contaminated water presents a bright and sparkling appearance, and the fact that no sickness has appeared in the family for a long time, if ever, may be advanced as evidence that the good quality of the water cannot be discredited, but in spite of all this there is death in the type of well I have described, and in the fullness of time the conditions will be ripe for a visit from the gaunt forms of disease and death. The danger cannot be overestimated of any open well, and particularly of this kind, becoming infected with the specific germ of that much to be dreaded malady, typhoid fever, and in this manner spread sickness and death where little expected. The last report of the Massachusetts State Board of Health notes an epidemic of typhoid fever caused by the use of contaminated milk. The laborers in a field which had been fertilized with the contents of a privy that had received the *excreta* of a typhoid patient were in the habit of visiting a certain well and, apparently, some of the filth from their boots had been deposited upon the loose plank covering of the well, which was used as a cooling receptable for cans of milk designed for distribution to customers at a later period. It is stated that the cans were submerged in the water, instead of being suspended in the usual manner, and that a leakage took place about the wooden stopper of the can, but any explanation or theorizing as to how *water* finds its way into *milk* would appear to be unnecessary.

In many localities in our State it is perhaps possible to obtain a supply from a spring situated at some distance from the house and at such an elevation as to deliver by gravity to the place of use. If the spring is deep-seated it will be safe to assume that it is and will remain free from pollution. Whether it is adapted to household use or not, on account of inorganic impurities, can be quite easily determined and will be most prominently indicated by the hardness of the water.

It is hardly necessary to say that the prospective proximity to the spring of dwellings or tilled fields may have a detrimental effect that should be carefully guarded against. Eternal vigilance is the price of a perpetually wholesome supply of water.

A water supply from running streams hardly merits consideration in this connection, on account of the limited extent it is likely to be used for ordinary household purposes. In general it may be said that a large stream with swift current flowing from a practically uninhabited territory will furnish water of satisfactory quality. The presence of cities on its banks, using it as a drain to receive their sewage and other wastes, would virtually condemn the water without a hearing. The smaller the stream the more suspicious the water will naturally become, and the small creeks and branches would hardly be considered as having any claims worthy of attention unless the surroundings were of an unexceptionable nature.

We may sum it all up by saying that it almost entirely depends upon the local conditions of the water-shed whether the water of a stream can be used with safety for domestic consumption. If a sparsely settled region, where the soil is cultivated to a limited extent only, the organic impurity will naturally be comparatively small and of vegetable origin. Still such supplies require to be zealously guarded to insure absolute freedom from danger, as witness the terrible epidemic of typhoid fever at Plymouth, Pa., a few years ago. The *excreta* of a typhoid patient some miles from the city had been thrown out on the snow, and the spring thaws had carried it into the mountain stream from which a part of the city derived its supply. The water had been of undoubted purity, coming as it did from a sparsely settled mountainous region, and it was a long time before any suspicion of the true cause of the epidemic was entertained. The part of the town getting its supply from a river of rather doubtful quality entirely escaped the epidemic. This fact, however, should not lead us to put our trust in water supplies of suspicious character, but rather to exercise strict watchfulness over the source of supply, however high its rank as a wholesome water, or however free it may appear to be from prospective contamination. The case I have just referred to is a striking example of the danger of a good supply being polluted by a specific germ of disease.

In some localities in our State a plentiful supply of water of satisfactory quality may be had from what are known as driven wells; that is, pipes perforated at the point and driven into the ground to the proper depth, the pump being attached to the surface end of the pipe. Of course this type of well presupposes that the mass of earth above the water-bearing stratum is virtually nothing but sand, and where the locality is thickly settled the chances are that the water will be contaminated with organic impurities leaching down from above. These waters are generally cool, of a fair degree of softness and well adapted for household use. In a sparsely settled locality it is quite probable that the surface impurities would be so small in quantity that they would be eliminated before reaching the ground water level, the sandy stratum acting as a filter of the intermittent type, which the very elaborate and extensive experiments of

the Massachusetts State Board of Health have shown to be the kind of filter best adapted for the purification of water contaminated with organic wastes.

Artesian wells—that is, wells deriving their supply from beneath impervious strata—are of such infrequent use in our State that little need be said in regard to them. They generally yield a water reasonably free from organic contamination, but with an excess of inorganic impurity. I do not think it unfair to assume that the majority of artesian wells yield water that is only considered fit for use because no other that is better can be had, to say nothing about those that no stretch of the imagination could credit with supplying potable water.

Rain-water stored in tanks or underground cisterns—preferably the latter—is the most available and satisfactory source of supply in many localities, particularly where the ground water is of an excessive degree of hardness, and running streams of suitable quality are not available.

Rain-water is the softest natural water found, and at a distance from large cities, or after there has been a sufficient fall to clear the atmosphere of the many impurities contained therein, is of undoubted purity.

It is not so palatable, however, as spring or river waters on account of its freedom from mineral matter and lack of aeration, and for this reason would be considered flat and insipid by one accustomed to the waters above mentioned. To maintain the natural standard of purity in the water it is necessary that the cistern be properly constructed in the first place, and due care taken to keep it, with its various appliances, in good order. It should be built in an accessible place, and conveniently arranged for examination and cleansing. The custom of placing it under some building cannot be too strongly condemned. The pump should be at some distance, so that any waste water from various household avocations, that are frequently carried on at the pump, will not be likely to get into the cistern through any possible defects in the original construction. No water should be admitted to the cistern until the roof has had a thorough washing off, especially after a prolonged season of dry weather, and the water should pass through a suitable filtering device. It is also considered advisable to store the rain-fall of the winter months only; and with all of the precautions above mentioned it is very desirable that the cistern should have a thorough cleansing each year. I am aware that the precautions I have outlined are more often honored in the breach rather than the observance, but it is only by the frequent reiteration of sanitary truths that we can get a reasonable amount of attention given to them, and it is very fortunate that the human organization is no more susceptible than it is to the insidious attack of disease.

I have not touched upon the matter of determining the amount of pollution in prospective sources of supply, as that properly belongs to the province of the water analyst. I have little confidence in the reli-

ability of the results of various popular "home-made" methods. Suffice it to say that the State has made suitable provisions for doing such service for its citizens, and no reasonable excuse exists for any one remaining in ignorance of the true character of their water supply. It is proper to say, however, that the old idea that one analysis is sufficient to determine the character of a prospective supply is no longer tenable. It is now well understood that frequent analyses, extending over a period of several years, are necessary in order to express a positive opinion on the subject, and even then it is highly desirable that a careful watch should be kept up continuously.

I am fully aware that nothing new has been presented for the consideration of the majority of those present, but the simplest of truths are only inculcated by frequent iteration, and if this paper aids in the slightest degree to the development of a more enlightened state of affairs relating to one of nature's greatest needs, the writer will feel well repaid for the time he has spent in preparing this brief paper.

The President then said: "Ladies and gentlemen, this finishes our afternoon session. The meeting will begin to-night at 8 o'clock at the same place. The ladies are especially invited."

The meeting then adjourned at 5 o'clock.

NIGHT SESSION.

The meeting was called to order at 8:30 o'clock by the temporary chairman, Dr. George Thomas, of Wilmington, in the absence of Dr. Balmson, who had to leave the city.

The first paper, entitled "The Importance of Disinfecting the Bowel Discharges in Typhoid Fever," was read by Dr. Wilson, Superintendent of Health of Guilford county:

THE IMPORTANCE OF DISINFECTING THE BOWEL DISCHARGES IN TYPHOID FEVER.

BY ALBERT R. WILSON, M. D., OF GREENSBORO, N. C., SUPERINTENDENT OF HEALTH OF GUILFORD COUNTY.

Mr. President, Ladies and Gentlemen:

Those of you who had the good fortune to listen to the comprehensive, practical and lucid paper of Dr. Thomas during the forenoon will have recalled to your minds by this paper many of the facts stated by him. However, the

subject is so important that I deem it unnecessary to apologize for repeating them.

The importance of typhoid fever as a disease dangerous to the public health is recognized by all physicians who have given sufficient thought to its cause and the modes of its conveyance; but I am sure that this subject has not yet received at the hands of the profession generally the time and study which it deserves. If this be true as to the profession, then we can at once arrive at the conclusion that the public general has not the knowledge concerning this disease and its prevention which it should have. It is a disease which prevails widely in all temperate climates. Some idea may be gained of its prevalence in North Carolina when you are told that there has not been a month within a year, dating from the first of August, 1893, to the first of August, 1894, in which typhoid fever has not been reported from at least 13 counties. Beginning with the September *Bulletin*, 46 counties reported typhoid fever, 54 in October, 51 in November, 47 in December, 24 in January, 19 in February, 13 in (each) March, April and May, 40 in June, 50 in July and 66 in August. You can see clearly that the disease has been continually with us for a year, and I doubt not that the reports for previous years would show it to have been present *all* the time in some one or other of the sections of our State.

When you are told or reminded of the fact that those between the ages of fifteen and thirty years are most susceptible to this disease (although none are exempt from infancy to old age), and when you take into consideration that this is the most important and the most active part of man's life, then count the cost of sickness, death and burial and loss of time from labor and school resulting from it in the aggregate, and when you are acquainted with the fact that from each case of this disease an epidemic might have its inception, thereby striking down from 5 to 1,000 persons, you can readily see what an important relation it bears to the public health.

Now, if by any means typhoid fever could be prevented, or even restricted, what a stupendous amount of suffering, sorrow, loss of time and labor would be saved, and in its stead would prevail health, happiness and prosperity! Typhoid fever is a preventable disease, and in one instance, at least, experience has demonstrated that it can be practically wiped out. When a doctor speaks of a disease becoming epidemic the people at once want to know what causes it and by what means it is conveyed. We can spend a few moments profitably in considering this cause and how it produces epidemics. It is believed by the best authorities upon the subject that there is a specific germ which causes typhoid fever, while yet there are others who do not. Typhoid fever is an infectious disease; if an infectious disease, then there must be an infective agent, and it has been proven that this agent, call it by whatever name you may, is always present in the intestinal canal of those sick of typhoid fever, and that it is present also in the discharges of these patients, and furthermore that it has the power of reproducing itself outside of the human body. It is

believed, and this belief is borne out by the observation and studies of some of the brightest and most logical minds in the medical profession to-day, that this infective agent, found constantly in the intestinal canal and in the discharges of typhoid fever patients, is the cause which produces the disease. By what means does this cause gain entrance into our bodies? Some authorities believe it to be feebly contagious, and that nurses attending typhoid patients, handling the bed and body linen and the discharges without proper precaution, contract the disease. Epidemics of this disease have been caused by persons drinking milk contaminated by the typhoid germ. This may be brought about by the addition of infected water to milk for adulteration, or by washing the vessels used to contain the milk in infected water. Again, the cause is said to gain entrance into the system by the inhalation of particles of dust or air contaminated by it. The most common means by which the cause is conveyed and gains entrance into our bodies is through drinking water which is infected. Reservoirs of towns or cities may be infected and thus cause wide-spread epidemics. Wells may be polluted by drainage into them of infected surface water. Springs, also, by having the discharges containing the infective agent washed into them by rains, or by percolation through the soil to the source of their water supply.

I will relate to you the details of an epidemic caused by contamination of a spring which came under my observation this summer. Six miles north of Greensboro is a chapel, near which is a sluggish spring, situated at the bottom of a basin formed by surrounding hills. From the lay of the hill-side forming this basin matter thrown on the ground at one point will be washed by rains directly in the spring or deposited in porous soil quite near it. If the matter be placed upon the hill-side at another point the drainage will not be directly into the spring, but whatever is washed down will be deposited above and about the spring. Situated near the top of one of the hills forming this basin is a cabin in which lived Mr. S—— and family, consisting of his wife, two sons and a young baby. This spring supplied the water for this family and the chapel. Mrs. S—— was taken sick on May 2d, and went to bed with fever June 17th.

Dr. Schenck was called to see the family. Mrs. S—— was then in the beginning of convalescence, and from the history she gave the doctor concluded she had been sick with typhoid fever, which conclusion was proven to be correct by the sequel. Upon investigation it was found that the discharges from this patient were thrown upon the ground at both the points mentioned, though most of them were deposited where the drainage would carry them directly into the spring for the space of three weeks. Between the 10th and 20th of May there were frequent rains. The husband and two sons were sick with typhoid fever on June 17th, all three having been taken sick about the 8th or 10th of the month. A. S——, a niece, had been nursing her aunt, Mrs. S——, and had the premonitory symptoms of fever at the doctor's first visit, and was advised by him to return home, which she did. June 23d she was sick with typhoid

fever. On the 25th M——, a sister of A. S——, was attacked by fever. She had also been nursing her aunt. A. R —— attended service at the chapel during the week ending June 27th, and drank water from this spring. On the 2d or 3d of July he was stricken down by fever. L. J—— also attended services at the chapel during the same week and drank this spring water. On the 9th she was also sick of typhoid fever. M. L—— visited Mrs. S—— often during her sickness and drank water from the spring. The 20th of June found her in bed with typhoid fever.

Let us review this evidence hurriedly. There was a case of typhoid fever; the infected discharges thrown out upon the ground at points from which they could be washed directly into the spring or quite near to it; rains to wash these discharges into and about the spring. Next, two young persons attending services at the chapel soon after these rains, and drinking water from the spring, were taken sick with typhoid fever. About the same time three members of the family using water from this spring were stricken with the disease. Next in order is a lady visitor to the house, who says she drank the water, and she, too, had fever. Finally, the two sisters who had nursed their aunt and drank the water were the last to sicken with the disease.

The chain of evidence submitted to you to prove that drinking water infected by typhoid discharges will produce an epidemic of this disease, I think, is complete. A notable epidemic which I will merely mention was that which occurred at Plymouth, Pa., in 1885, caused by the discharges from one case of this fever.

How can typhoid fever be prevented or restricted is a question of great importance to us all, not only as individuals and families and communities, but it is of such moment that it interests us as a State and nation. The question will be answered by simply telling you to disinfect the discharges. If we had pure water, good sewers, good drainage, clean towns and clean homes, there would be less of this disease, certainly. This cannot be so as long as the typhoid discharges are thrown out undisinfected and the infective agent allowed to propagate and drain into and pollute our water supply. You can see that all efforts tending to protect ourselves, our towns and cities by supplying good water, keeping clean homes and providing good sewers are all subservient to the one vital point—the disinfection of the discharges. You have seen how one case could infect a spring and cause several cases; so one case could produce a thousand under favorable conditions, as was the case in the striking epidemic at Plymouth, where 1,000 were stricken and over 100 deaths occurred. Had the discharges in each of the cases cited been thoroughly disinfected and properly disposed of these epidemics would have been averted. Recall to mind that each case may and can, under favorable conditions, produce an epidemic, and then think how prevalent the disease is and how little is done toward its prevention, and it is easy to see how liable we are to epidemics. What are disinfectants, and how can they be used effectively? A disinfectant is "an agent capable of destroying the effective power of infectious material." The destruction must be thorough, for so long as there is vitality in the infective

agent it will reproduce itself; therefore try to do thoroughly whatever is attempted in the way of disinfection. Bichloride of mercury or corrosive sublimate, chloride of lime and milk of lime or whitewash are the disinfectants recommended to us by our State Board of Health for the disinfection of discharges. There are other disinfectants, but these have been chosen for their effectiveness, cheapness and because, with proper care, any one can use them.

There is a distinction which I wish to call to your attention, and that is the difference between a deodorizer and a disinfectant. Copperas is a deodorizer, one of the best, but it has been proven by experiment that a saturated solution of this substance does not "destroy the infective power of infectious material." It is commonly used as a disinfectant, but as such, in the sense of the definition of disinfectant as given, it is useless, but as a deodorizer it is to be valued. Bichloride of mercury is to be used in solution in the proportion of two drachms to the gallon of water. This solution should be colored on account of its poisonous properties. The solution of chloride of lime is made by dissolving six ounces of it while fresh in a gallon of pure water. This solution should be prepared as needed. Milk of lime or whitewash is made by reducing to powder one quart of quick lime by the addition to it of one quart of water, then adding to the powder three quarts more of water. Store in a tight vessel till needed. Be sure your whitewash is fresh when you use it, and to insure this make a new supply every few days. To disinfect the discharges place at least a quart of either of these solutions in the vessel intended to receive the discharges, and see to it that the evacuation is well mixed with the disinfecting solution, and allow the mixture to stand from a half hour to an hour before emptying it into the water-closet or burying it, as the case may be. Preferably, in disposing of the discharges by burial, seek to place them, if possible, where the soil will not likely be disturbed by upturning, not upon a hill side, and certainly not within 100 feet of any water supply. These are practically the directions laid down by our Board of Health, and if properly carried out, along with subservient measures, typhoid fever will eventually be removed from our land. In the preparation of this paper I have availed myself of, and drawn upon, the best authorities at my command. In presenting it I have tried to set before you the important relation typhoid fever bears to the public health; to tell you what is believed to be the cause of the disease; by what means it is conveyed into our bodies and how epidemics are produced by it; and finally, what is meant by disinfectants, and how to use some of them.

Much more could have been said upon each phase of the subject as presented, but if it has awakened an interest in or stimulated a desire to know more about the subject, or convinced any one of the great importance of disinfecting the discharges in this disease, it has accomplished good.

Dr. Thomas: "I hope that this meeting will be participated in by the audience; that they will ask questions when they don't understand and I am sure that Dr. Wilson will be pleased to answer any questions that he can."

Dr. Lewis: "I have been asked by our esteemed member, and your valued citizen, Dr. Whitehead, to explain the Plymouth epidemic, which Dr. Wilson referred to in his excellent paper. Plymouth is a town of 10,000 inhabitants, on the Susquehanna river. The main water supply was from a beautiful mountain stream, the water-shed of which was covered entirely with woods, and on that water-shed there were two small huts. In the month of February a man who was a relative of the family occupying one of these huts went there on a visit from Philadelphia. The ground was frozen solid and there was snow on the ground six feet deep at the time. Soon after he got there he had typhoid fever. His bowel discharges, undisinfected, were thrown out on the snow. He improved, but relapsed, and the consequence was that his case continued for a long time. On account of the freeze the people had to use water from the Susquehanna river and from wells in the town. The water of the Susquehanna river was very ordinary water, to say the least, and the wells in the town were, according to chemical examination, simply villainous. On the 26th day of March came the spring thaw. The snow melted: the usual water supply of the town was replenished, and again used. Now this water, chemically pure, but contaminated with the typhoid fever bacilli, was turned into the town on the 26th day of March. On the 10th of April, or fourteen days after (the incubative period of typhoid fever), the first case of the disease broke out in a family immediately below the dam, who probably drank of the seepage; and within three months there were over one thousand cases of typhoid fever; and before the end of the

year more than one thousand one hundred, in a population of ten thousand. There was that single case of typhoid fever: the ground covered six feet with snow: and that one single case, owing to the negligence or probably ignorance of the people living in that hut, was the cause of this terrible epidemic and over one hundred deaths. If the evacuations had been disinfected, with little trouble and practically no expense, all that sickness and those deaths would have been prevented. Now this is a very important object-lesson, and I hope you will bear it in mind. Any one that will not disinfect the bowel discharges of typhoid fever is, to say the least, criminally negligent. Every householder who has in his family a case of typhoid fever, and who fails to follow the instructions of his physician in this respect, is liable to a fine. He ought to be liable to a fine and imprisonment: but the practical difficulty is to punish anybody for this negligence, for the reason that the people are all so indifferent on the subject. If a case of fever or any contagious disease was in your neighbor's family, and your wife or children, through the negligence of your neighbor, were to catch this disease and die from it, how would you feel about it? I am sure that you would be very indignant, to say the least. You would feel that he ought to be punished for such negligence: and I think that it should be a law of the State that if any person should lose his life through the criminal carelessness of another the person guilty of such carelessness should be liable to his estate in a money fine. It is a sad commentary on human nature, but whether sad or not it is true, that if you can convince a man that he is going to lose money if he neglects a certain thing, he will not neglect it: but if you preach to him from now until doomsday that he is going to lose his life, or the life of his wife or child, then he will say 'Oh, this is some of your absurd

theory; I will attend to it next week,' etc. but never does. We hope that we will make an impression upon you in regard to this matter, and we want you to think about it, and believe in it, and act upon it. It is simply incalculable the amount of good that would be accomplished in the long run."

Dr. Thomas: "If any one wishes to ask any questions we will be glad to answer them if we can."

Dr. Whitehead: "Mr. Chairman, the town of Salisbury receives its water supply from two sources—from wells and from the water-works; in other words, the water from the creek, which is used very much by the citizens here. The creek flows thirty-six miles through a clean country, and it receives a good many branches before it reaches down here. The creek is a pretty bold, free creek. The water is filtered through the American Filter, which is composed of finely packed sand. I have never seen a chemical analysis of the water after it comes through the filter; but if there is anything the matter with the filter we get the 'reverent stuff.' The superintendent of the water-works is in the audience, and he is able to give you a fuller account of this water than I am. As far as the wells are concerned the town is becoming more densely populated, and the time is coming when we will have to give up the wells. I think from what I know of the water that it is very good water, and I think the water supply of Salisbury will rank very favorably with the water supplies of the other towns; but the superintendent is present, and he will be able to give you a much fuller description of our water than I can."

Mr. Neeve, Superintendent of the Water-works: "Our source of supply is about thirty-six miles long, and it is supplied, as Dr. Whitehead said, by branches on both sides, and the water for about nine months in the year is very good, clear water; but during the season when the fields

are ploughed up and the heavy rains come we have pretty muddy water. We have an American Filter, composed of about five and one-half feet of sand, and the water is filtered through that by pressure, and we also use alum. We always try to get pure water, but owing to accidents sometimes the filter gets out of order; and we have had to have some little muddy water, but as a rule we have very clear water."

Dr. Thomas: "Are there many people living along this creek?" "No, sir, not very many. It is very thinly settled."

Dr. Lewis: "Mr. Neeve, I would like to ask if there are any mill-ponds along this creek?" "Yes, sir; there is one."

Dr. Lewis: "How far is it from the reservoir?" "About five miles."

Dr. Whitehead: "There is one important point that Mr. Neeve has not stated; and that is that whenever he hears of any case of typhoid fever in that section he goes to the house and has the necessary precautions taken; but as he has not referred to it I think that, in justice to him, something ought to be said about it."

Dr. Whitehead: "The quantity of the water used by the town will about consume the quantity pumped into the town every day, will it not, Mr. Neeve?" "Yes, sir; we pump just what is used during the day—about 350,000 gallons a day. There is no surplus."

Dr. Lewis then explained the establishment of the waterworks in Raleigh; about the difficulties they had in getting the Board of Aldermen to seek the advice of the County Board of Health before making the contract. Dr. Lewis wound up his remarks by saying that he thought the water supply of Salisbury was in a fairly satisfactory condition, and that, in his opinion, it was much safer than the ordinary wells of the town.

There being no more business before the Board, the chairman of the meeting arose and said: "We greatly regret, ladies and gentlemen, that the Board of Health is going to part with you. I assure you that we have been exceedingly cheered by your presence. It is the most encouraging sign that I have ever seen to have the women take an interest in these meetings, as they have the care of the household and the children. I therefore say that we feel especially thankful that this visit has impressed itself upon the women; and I feel sure that if we leave any impression on them the sanitary condition of this good old town will be improved."

The meeting then adjourned at 9:30 o'clock.

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1 Biennial report,
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